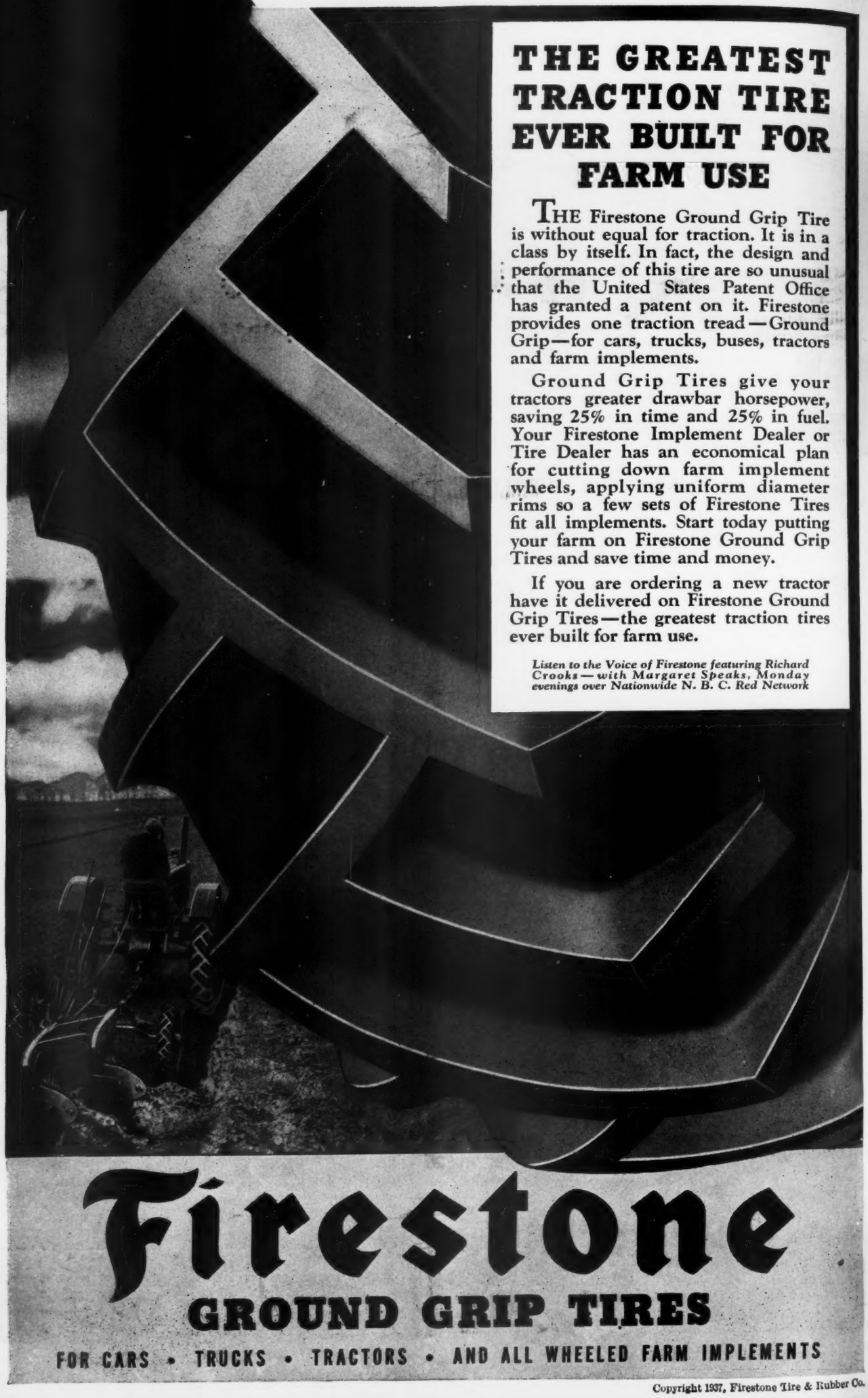

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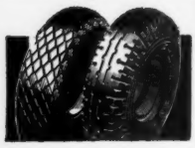

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APRIL 1937

VOL. 57 • THE NATIONAL FRUIT MAGAZINE • NO. 4

DIVERSIFICATION ON THE FRUIT FARM

IN the March issue of *American Fruit Grower* a series of articles by competent authorities on small fruit and their culture was offered to the readers, and in this issue a series is being presented on the stone fruits. The fruit industry of America is specialized and each group merits special consideration from time to time.

While statistics show that there are more individuals engaged in growing the apple than any of the other deciduous fruits, yet the others represent large investments and are often very hazardous because they are less hardy and, also, they have some serious insect and disease pests. This makes it all the more important to bring to our readers the latest information regarding them.

Diversification on the fruit farm is highly desirable in some sections and undesirable in others. So long as the erratic nature of our climate results in losses by frosts, freezes, hail, disease, and insects, the provident growers should have a cash income from more than one source or crop. But diversification of crops means diversification of information and techniques. This has been a stumbling block to many because it is not much of a human trait to change one's occupation or routine. But the important thing is to make the land earn all the income possible so far as it is consistent with good husbandry.

Probably one of the greatest stimuli to diversification is nearness to large consuming centers. The further removed one is from the large markets, the more likely he is to grow one or two crops on a large scale. The roadside and nearby city markets call for products over practically the entire year and this demand has resulted in many a grower changing his crop program to meet the demand.

Another advantage of diversification is the better distribution of labor. When the peak of the work for different crops comes at different times of the year, the labor can be employed more regularly, which is better for all parties concerned. We see this in many lines of agriculture. In the past the florist grew nothing but flowers and the vegetable forcer nothing but vegetables. Today his plant is often used to better advantage by growing some of both or all of one at one time of the year and all of the other at some other season. Similarly, there have been shifts from the large scale truck gardener to market gardening, and marketing to small fruit culture.

In the older communities a "balance" has been established between crops best adapted to the locality and conditions and the labor supply. Usually this should be departed from with caution. But there are so many conspicuous examples of individuals who have changed their set-up and increased their income that it is worthy of careful study.

It is important to recognize the seasonal activities of the major crop and make any others fit into the off seasons. For instance, the critical labor period for apples begins in late August and pyramids until mid-October and then drops off perceptibly until mid-November. There is another smaller peak beginning about the first of April and extending during the spray season and spring work until early in June. On the other hand, there are comparative lulls during July and August, depending somewhat upon the amount of thinning, and again from December until mid-March. These seasonal periods can be recognized for each fruit and crop by those who keep books of their farming operations, or by the payroll accounts alone. This gives the best index of what other crops will fit into the orchard scheme with least interference.

True, many orchardists take advantage of these lull-times to get away from the farm and hold that that is an advantage over the live stock farmer. We have no quarrel with these individuals but not all prefer this option.

The best system of diversification would vary for different sections. That small fruits and stone fruits can frequently augment the income of the apple orchardist, and vice versa, must be patent to anyone who has seen the trend in many states. This is somewhat of a swing of the pendulum back to the earlier days, but a healthy one. With improved varieties of peaches, prunes, raspberries, strawberries, and others,

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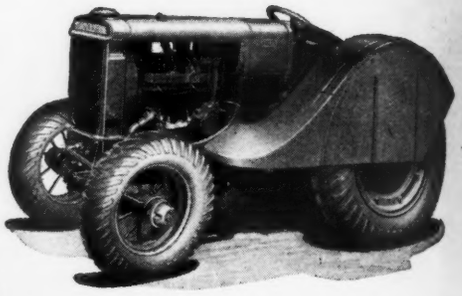

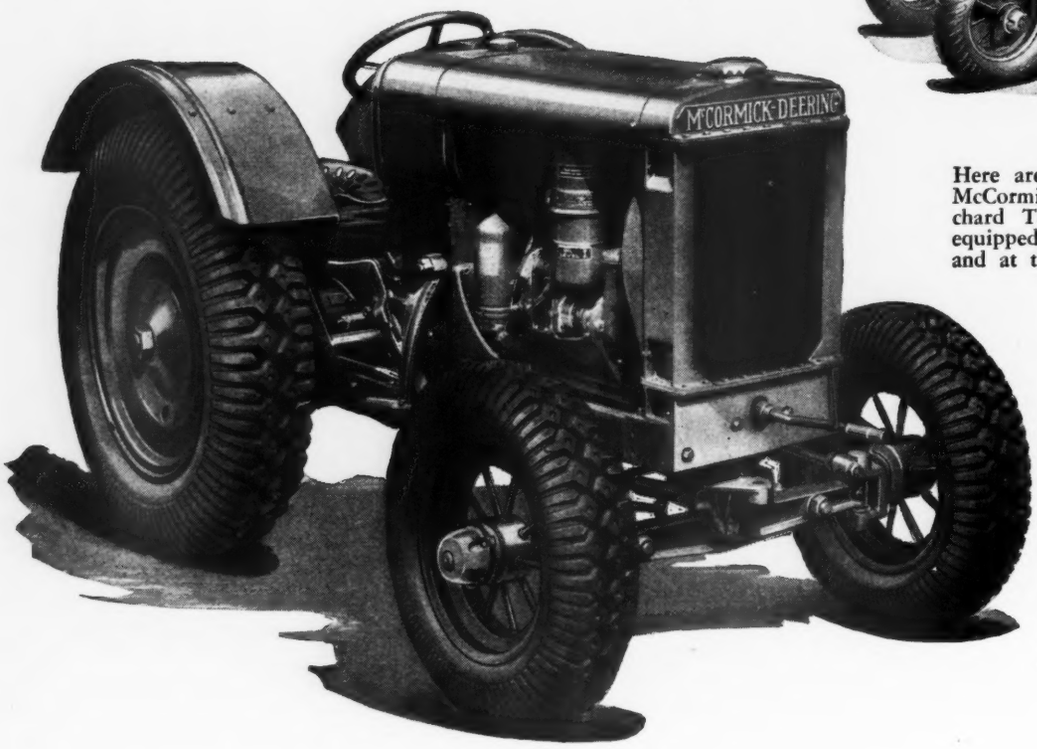

Here are two views of the popular McCormick-Deering Model O-12 Orchard Tractor. It is shown above equipped with special citrus fenders and at the left with standard equipment. The Model O-12 is a handy, compact, powerful little tractor that fits in well in most orchard, grove, and vineyard operations.

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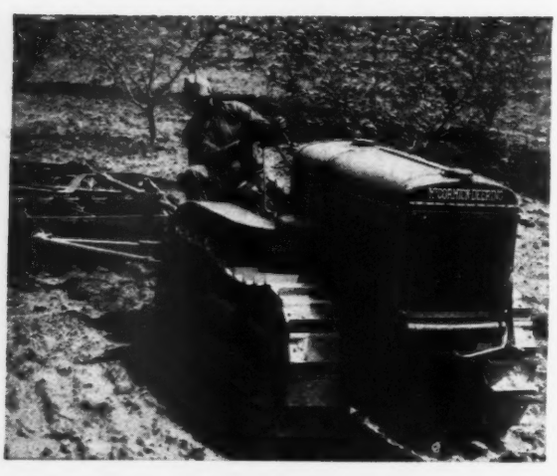

Above: Disking a young orchard with a McCormick-Deering outfit. TracTracTors are available in three sizes: Model T-20 (shown), Model TA-40, and Model TD-40 Diesel.

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Site selection is an important consideration in peach planting expansion. Trees in depression, shown in photo, are small and defoliated, while those on higher land show good growth.

PROFITABLE PEACH PRODUCTION FACTORS

By F. P. Cullinan
Senior Pomologist, U. S. Department of Agriculture

•

The following article is a digest of Dr. Cullinan's talk presented before the joint meeting of the American Pomological Society and the Virginia State Horticultural Society.—EDITOR.

ACCORDING to figures recently released by the Bureau of Agricultural Economics, the number of peach trees in the United States has declined during the period of 1930 to 1935 from 79,000,000 to approximately 67,000,000, and bearing trees from 59,000,000 to 54,000,000. The proportion of trees not of bearing age has declined from 25 per cent to 19 per cent of the total. It is expected that the annual production of peaches during the next five years will be somewhere around 45,000,000 to 50,000,000 bushels. In other words, unless growing conditions are extremely favorable, with the present number of bearing peach trees we should not expect the peak of production of 76,500,000 bushels reached in 1931. This was the largest total production in this country in 36 years.

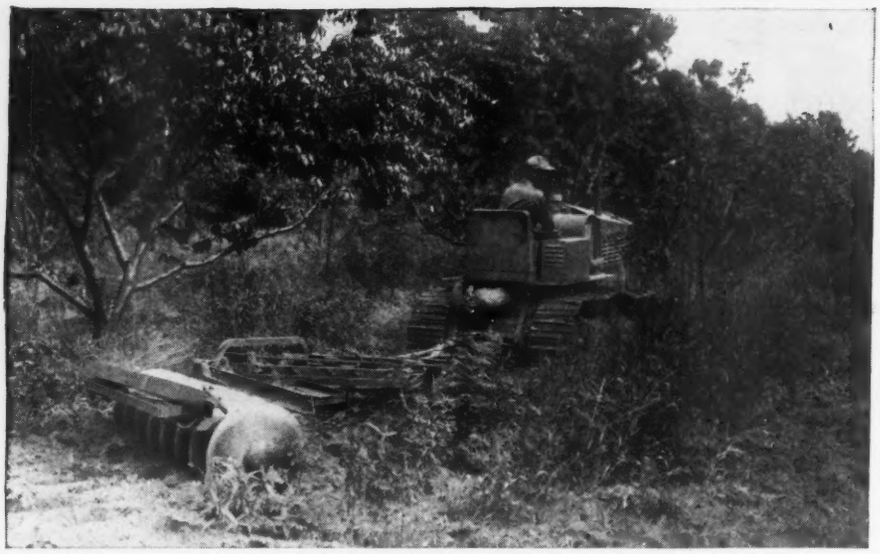
With this decrease in the number of bearing trees and the prospects for continued fair prices for peaches during the next five years, it is probable that there will be considerable new replanting. It would be most unfortunate, however, if there should be a marked increase above what is necessary to replace trees now going out of production.

Factors that should be considered in a rational replanting program include site in relation to frost hazard, varieties that have proved unprofitable because of unproductiveness or susceptibility to cold injury, plantings in regions where severe winter injury has resulted in heavy bud and tree mortality, varieties that have proved unpopular on the market, and the production of poor quality peaches that are not only unprofitable to the producer but tend to lower market prices.

Although the prices of peaches during the past two years have been very satisfactory for those who have been successful in obtaining a good crop, the profitableness of the business

"It is a safe prediction that commercial peach varieties of the future must be of higher quality if this fruit is to hold its place on the market in competition with other fruits"—

Says Dr. F. P. Cullinan, who is shown here as the American Fruit Grower camera caught him just after delivering his address, reviewed on this page, before the fruit meeting of the American Pomological Society and Virginia State Horticultural Society at Roanoke, Va.



Experiments are being carried on to reduce the amount of cultivation necessary in the peach orchard as is being done in above photo at the Mantle and Mantle Lake Erie Farms Orchard in Ohio.

should be considered over a longer period, based upon the average yield per acre obtained during the years of crop failure as well as the years of good production. Most fruit growers, both apple and peach, are convinced after the past six or seven years' experience that they cannot hope to remain in the fruit business if a high average yield per acre is not maintained.

The problem of maintaining vigor in peach trees is one of the most important to consider. The peach tree, relatively speaking, is not a long-lived tree, nor is it especially vigorous and hardy except under the most favorable conditions. The response from applications of nitrogen is particularly noticeable when the trees are young and have not produced heavy crops of fruit. As the trees grow older it becomes more difficult to maintain the proper terminal growth and vigor in peach trees in years following heavy production. On some soils we find that peach trees do not continue to maintain satisfactory terminal growth even with fairly large applications of nitrogen. It is not to be inferred that nitrogen is the only fertilizer element that is beneficial to peach trees. We know that trees in order to grow and be productive require other fertilizer elements, such as phosphorus, potash, magnesium, etc. These, however, have usually not been of great concern to the fruit grower in the past since the soils themselves, generally speaking, have been fairly well supplied with adequate reserves of these mineral elements or they could be added through cover crops or barnyard manure.

The use of cover crops as a means of increasing the reserves of nutrient supply in the soil has not been as widely practiced by the peach grower as it deserves to be. During the past four years we have been carrying on some studies to determine whether or not we can satisfactorily grow a young peach orchard with a minimum amount of cultivation. We have had in mind two things: first, the increase in the fertility of the soil through the use of cover crops, with the possible increase in organic matter content, and, second, the effects of these cover crops on moisture and nitrates as they affect growth and production. The trees received uniform cultivation during the first year, and a summer cover crop of soybeans was grown followed by rye and vetch in the winter. Beginning with the second year, we have used on the different plots sweet clover and lespedeza as legume sods, summer covers of soybeans, buckwheat and crotalaria, followed by a winter cover crop of rye and vetch.

The lespedeza plot was disked up thoroughly in late winter to incorporate the dried plants and seeds into the soil, and thus facilitate reseeding. A fine stand of plants was obtained every year by late March to early April. The sweet clover was seeded in March, when plots were first established, and was not clipped in this or the following year. With the second biennial crop, it was clipped in the first and second years, being disked up after seed formation in the second year, and seeded again in August. In the four years of this experiment there have been two crops of biennial sweet clover.

Where summer cover crops of soybeans and buckwheat were used they were seeded about June 1. The crotalaria was usually seeded two or three weeks later. The summer covers were disked up in late August and were followed with a seeding of rye and vetch for a winter cover. This in turn was disked up in mid to late April, depending upon the earliness of the season.

At the time of seeding of the summer and winter cover crops, 250 pounds per acre of a 5-8-5 fertilizer was drilled in with the seed. A similar amount was drilled in the lespedeza and sweet clover plots early in the spring. This fertilizer was primarily for the growth of the cover crops and the trees received what was considered an adequate application of nitrogen consisting of one-half pound of nitrate of soda in the first year and increased to three pounds in the fifth year, broadcast around the tree.

The best growth to date on the five-year-old trees has been made on the plot receiving only a winter cover of rye and vetch. The trees receiving summer covers, particularly soybeans, made very satisfactory growth but it was apparent that they were somewhat smaller. The trees in sweet clover and lespedeza were the smallest of all.

In the four years of this experiment, particularly in 1934, 1935, and 1936, we had periods of dry weather during the growing season and were thus afforded an opportunity to study the effects of the cover crops on moisture.

(Continued on page 34)

Organic matter is of importance in peach soils. Illustration on the left shows Joe B. Hale, secretary of the Illinois State Horticultural Society, preparing to spread straw in his peach orchard at Salem, Ill.

PEACH THINNING

OR TREE CONDITIONING THE CROP

By M. J. Dorsey
University of Illinois

THINNING is a very necessary part of peach growing and takes its place primarily as a means of regulating the size of fruit. Fortunately, thinning is not always necessary, but when it is, it is almost fatal to leave this operation undone. Since the more recent research shows that thinning is not as simple as it was once thought to be, let us take a practical look at the thinning problem and take stock of some of the variables involved in tree conditioning the crop.

The peach grower is confronted with a thinning job any time the bud survival is sufficiently heavy for an excess set. Potentially, this is always the case, because a mature peach tree may bear anywhere from 5,000 to 40,000 flowers. Counts have frequently been made of trees bearing as many as 4,000 to 6,000 fruits after the June drop when a further reduction in the number is relatively light. Consequently as the season advances, the problem of weight alone becomes more and more serious.

The question, then, of how many fruits should be left on a tree becomes a very important matter. As an approach to the problem, we might well consider, first, the relationship between size of fruit and the number per bushel. Counts in the Illinois experiments show that the number of fruits of the different sizes in 50 pounds to be as follows: 1¾ inches down, 500; 1¾ to 2 inches, 300; 2 to 2¼ inches, 240; 2¼ to 2½ inches, 210; 2½ to 2¾ inches, 150; 2¾ to 3 inches, 100.

With these data at hand, it will be seen at once that there are two ways of obtaining yield per tree: one by increasing the number of fruits and the other by increasing size. Naturally, then, the thinning problem takes its place in "adjusting the crop to the tree," to use an old expression, somewhere near the point where the better commercial sizes will be reached under average conditions.

Experienced growers can tell at a glance what would be a fair yield for a given tree condition year in and year out. For our present purpose, suppose we assume that five bushels would be a fair yield for a given tree condition. Obviously, from the number per size given, five bushels may contain as many as 2,500 peaches or as few as 500, depending upon the size. If the desired size for a given tree condition would be about two and one-fourth inches, then it will be seen that in the neighborhood of 1,000 or 1,200 peaches should be left on the tree after thinning.

Of course, it is out of the question to count all of the peaches in an orchard, but in starting crews to work it is easy to pick out a typical tree, count the fruit on it before thinning, thin it, and then count the number pulled off as well as the number left on. Experienced help will soon get the pattern in mind and the crop can be evened up in the orchard very skillfully, leaving everything on some limbs or thinning others according to the type of tree. In this way thinning can be done without seriously cutting the yield, although our experience shows that it is difficult to determine exactly the number of peaches which should be left on the tree to get the maximum size for a given tree condition without reducing the yield.

With the potential set so heavy and the thinning job increased accordingly, the time of thinning then becomes a very important consideration. Under practical conditions the practice heretofore has been to wait until after the June drop. This recommendation needed experimental verification however, so at the Illinois station the results show that the time of thinning can be left without serious risk until after the June drop.

This whole matter can be readily understood by taking into consideration the natural drops on one hand and the growth periods of the fruit on the other. The usual drops in fruit are referred to as the first, second, and third or June drop. This latter is also sometimes spoken of as the physiological drop. It is by far the most conspicuous of the three in the peach, because the fruit is larger at the time, although the reduction in the total number of blossoms or fruits may be extensive in either of the first two drops. It would seem unnecessary to start thinning before the natural drops are over unless the acreage would require it.

The measurements at a number of stations have demonstrated three well defined growth periods in the peach.

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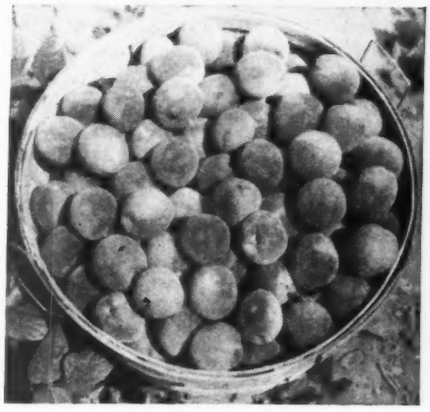
About 100 fruits in this bushel.



About 240 in this one.

And 400 in this one. How much difference in price?

A good job of thinning as shown by the uniformity of these "tree run" peaches.

CHERRIES •

"LITTLE LEAF" CONTROL

Sweet cherries suffering from the condition known as "little leaf" have dwarfed, light-colored foliage which is often clustered. A tree affected in this manner usually dies in a year or two or is so weakened that it is worthless. This condition is also known as "rosette" and may be troublesome on many deciduous fruits.

While speaking before the Oregon State Horticultural Society, O. T. McWhorter, Oregon extension horticulturist, recommended the use of zinc for the improvement of trees affected with "little leaf." He stated that zinc tacks were suggested for small trees. The tacks are placed one-half inch apart and spirally around the tree. They are spaced one inch or more apart around the trunk to prevent girdling. Placing of the tacks is important, and they should be driven into the tree at least one-half of their length.

On badly affected trees of all ages at The Dalles, zinc sulphate used at the rate of one-half pound to 50 gallons of water, with or without lime, gave satisfactory results. When lime is desired, it is used at the rate of one-twentieth pound to one pound of zinc sulphate. Less injury to foliage was noted at The Dalles when spraying was done after 4:00 in the afternoon. The "little leaf" condition on young cherry trees, causing dwarfing and usually death of the tree, merits attention by careful use of zinc sprays and zinc tacks until the trees reach seven or eight years of age and are free of all symptoms of the condition.

Mr. McWhorter indicated that from available information the first zinc spray should be given just before the buds open and others should follow a month after the leaves appear. Zinc sulphate sprays using 10 to 12 pounds to 100 gallons of water with five pounds of lime have given good results where there is danger of foliage damage.

Zinc sulphate injections were made in trees eight years of age and older by boring holes an inch and a half deep, three-eighths inch in diameter and spaced four to five inches apart around the tree trunk at the ground line. The holes were filled with zinc sulphate to within one-half inch of the outside. The openings were then sealed with grafting wax.

Cherry trees which had 90 per cent affected leaves have shown normal appearing foliage of a dark green color the following year after zinc injections were given in the fall. July-treated trees showed improvement in six weeks with no sign of injury resulting from the injections.

A heavily mulched raspberry planting

CITRUS •

COLD HITS GROVES

California citrus growers are contemplating tree repair measures after a period of extreme temperatures never before equalled in southern California. While much fruit was frozen during the cold wave, it was surprising to note that there was comparatively little tree splitting.

Orchard heating practices stood a most grueling test against the low temperatures. It is estimated that 80,000,000 gallons of oil were consumed in the heaters. Cost of the oil alone has been set at $3,200,000 and it is probable that total cost of heating practices for grove protection amounted to more than $10,000,000. Growers who heated their groves were repaid by the survival of a good portion of their crops, while those who did not resort to heating lost their entire crop. It is stated that 4,000,000 heaters were used to combat this freeze.

Growers derived some benefit from the low temperatures in that future precautions will be taken to provide sufficient storage capacity for fuel oil, a greater supply will be carried throughout the danger seasons and facilities for rapid delivery of oil will be arranged. In the future growers will probably hire two crews of workers to take care of lighting and refilling the heaters and hauling oil.

California horticulturists advise that no citrus pruning be done during the coming season and that pruning next year should be light, confined to dead-wood removal, with thinning out where foliage is particularly heavy. For protection against sunburn, it is desirable to whitewash exposed branches. Unless disinfectants are applied to injuries before they are covered with a wound dressing, there is danger of heart-rot fungi attack. A good disinfectant is one quart denatured alcohol, one-fourth ounce mercuric cyanide and three quarts of water.

BERRIES •

BLACK RASPBERRY MULCHING

Results of a two-year test on black raspberry mulching, conducted by Dr. Leon Havis of the Ohio Agricultural Experiment Station, have recently been announced. This test was started in March, 1935, when wheat straw was applied at the rate of five to six tons to the acre. The plants were Cumberland black raspberries set out in 1928. Unmulched check plots were cultivated during the two seasons of the test.

Value of the straw mulch was especially significant in 1936. Foliage, vigor of new canes, and general appearance were superior in the mulched plots. In 1935, the total number of canes produced was only slightly higher in the mulched plots, but in 1936 the number produced was much greater.

Other advantages of the mulching were apparent. Berries grown in mulch are less likely to be hampered in appearance by soil contact. There is no need for cultivation of the mulched plot as weeds are almost entirely eliminated. The prevention of soil moisture loss is another definite advantage of mulching. In addition to these benefits, Dr. Havis states that evidence indicates the mulch aids in protecting the roots and crowns from winter injury.

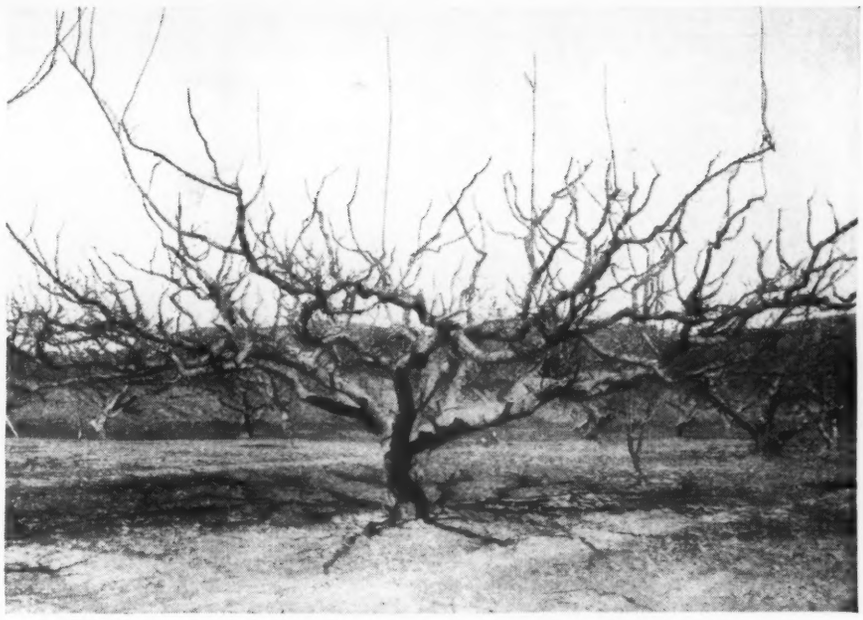
Labor involved in applying the mulch may be spread over a long period of time and can be done when the grower is least busy. Danger of fire from the mulch may be minimized by leaving strips of unmulched soil in the planting. In some cases only alternate strips between the rows are mulched when fire hazards are present.

It is evident that when wheat or oats straw is used for mulch, it is necessary to increase the usual application of nitrogenous fertilizers. This practice is especially desirable for the first two or three years after applying the mulch.

Where mulching is practiced only in the rows and a few feet on each side of them, it is necessary to cultivate the areas not mulched.

STRAWBERRY ROOT AREA

On some soils it has been found that 90 per cent of the total strawberry root system is located in the top six inches of soil. In many cases 70 per cent of the root system was in the first three inches. This feeding area indicates need for proper moisture in strawberry soils, supplied by irrigation, mulching, and the addition of humus materials.



Top (Fig. 1)—Eighty-year-old Royal apricot tree on peach root, pruned by the so-called Winters system. Pruning, thinning and harvesting are accomplished from a nine-foot ladder. This tree has a spread of more than 60 feet.

Center—Fifty-year-old Royal apricot tree on Myrobalan root. The system of pruning here employed is typical of possibly 50 per cent of the bearing apricot acreage of California. Note that bloom is largely confined to upper portions.

Bottom—Twelve-year-old Royal apricot orchard on apricot root, pruned by "thinning out" only. Trees are planted 25 by 25 feet. Orchard operations are conducted with a 10-foot ladder.

CERTAIN PHASES OF APRICOT CULTURE

By Warren P. Tufts
Pomologist, University of California

IN addition to the United States, only Australia, the Union of South Africa, Syria, and Persia produce apricots in commercial quantities. Comparable statistics are unavailable. Australia and South Africa sending canned and dried apricots to the markets of the United Kingdom, compete directly with the United States. In general, Syria and Persia do not enter competitive markets.

Commercial production in the United States is practically confined to California, which in 1930 had 93 per cent of the total tonnage and 89 per cent of the trees. Washington, ranking next, produced three per cent. Between 1920 and 1930, Utah, Colorado, Oregon, Idaho and Washington increased their plantings 560 per cent; California 13 per cent. In 1929, the 11 western states produced 98.6 per cent of the U. S. tonnage. The western states, other than California, market their apricots in the fresh condition; largely in the Pacific Northwest, which does not seriously compete with the California crop, which is sold dried (70 per cent), canned (20 per cent) and fresh (10 per cent). California has the earliest season (May 15 to July 15).

Before the World War, 68 per cent of the dried product was exported; during 1922-1926 only 53 per cent. More apricots are now canned than formerly and fewer dried. Although fresh shipments in California have increased in recent years, they constitute a relatively small portion of the annual crop of about 240,000 tons from 80,000 acres.

Most growers of deciduous fruits

(Continued on page 26)

The Stanley plum, one of Mr. Burkholder's favorites which he will use in his new planting.

MY FORTY YEARS IN

PLUM PRODUCTION

By HIRAM BURKHOLDER

IF you are going to plant a plum orchard, I believe you will be interested in experiences I have had with plums over a 40-year period. When I planted my first trees in northern Ohio, I knew scarcely anything about kinds and so set the varieties widely offered at the time. Most of these proved unsatisfactory, the fruit being insipid or too acid. I have since dug out many of these trees and have grafted over many others.

Such promiscuous planting in nearly all orchards has been responsible for the comparatively light consumption of plums. Consumers have turned to other fruits after a few experiences with poor quality sorts. It is going to take years of growing and selling the better varieties to retrieve the plum market. Many opportunities for developing a worthwhile market and making a profit await the grower starting out at this time with quality varieties, in my opinion.

In the matter of varieties, let us first consider the Japanese sorts. These are early bloomers and are frequently killed by late frosts. They are clings and are acid about the pit or skin or both. The foliage is tender and is injured by the sprays used on the European varieties. This is an important item where they are not planted in large blocks so that sprays can be mixed especially for them. The fruit of such types as Monarch, Gneii, Shipper's Pride, Moore's Arctic, Imperial Gage, Quackenboss and others is very apt to discourage consumers in the use of plums.

The old Lombard continues to be a favorite with some of my customers. It is good when thinned and allowed to ripen on the tree, but it is biennial and loads so heavily in the bearing year that it requires thinning to obtain size and quality. Imperial Gage is fine for eating fresh, but when cooked is soft and more acid than Reine Claude.

If stocks were wanted upon which to "work" better varieties of weak-tree tendencies, we could not do better than to use Imperial Gage, Hand and Quackenboss.

Of the varieties I am setting to increase our plantings, I would mention Stanley prune first. It is a good grower, an early bearer, of high quality, free stone, an annual producer, and ripens about with Italian prune.

Imperial Epineuse is a high quality prune, of reddish color, and one of the finest in the prune class to eat out of hand. It sells freely from roadside stands. It is also excellent when cooked. The tree has a scrubby growth for several years but later makes a good spreading tree. Its buds are hardier than Italian or Hall, but not quite as hardy as Stanley. It is not nearly as early in starting to bear as Stanley. Demands for this prune among my customers are increasing.

I must mention my experience with the new Hall prune. It has proved very susceptible to winter injury of the fruit buds. The tree forms nicely but is not a fast grower and is quite subject to shot hole fungus and body trouble near the ground, as is Grand Duke. It is one of the finest prunes in shape and quality I have seen, but I am starting to work my youngest trees over because of the tenderness of the fruit buds.

Another of the new prunes mentioned favorably in some places is the Albion. I have a few young trees not bearing but expect to plant more, although some growers report it as not being very prolific. The fruit is large and late ripening.

I have grown just a few Elephant Hearts on grafts. I am not familiar with the tree characteristics, but the plum is of good size and quality.

German prunes make large, lovely shade trees but have not produced enough fruit in the past to be worth considering. The fruit is small but good. Italian prune (Fellenburg), of which I have more trees than any other variety, is late starting to fruit and seldom has a good crop.

I have a good many large French damson trees (my favorite damson). Shropshire damson fruit is smaller, of not as good quality, and the tree is not shaped as well. It sells as well as the French on city markets, however, because some consumers are suspicious that French is not a damson. I sell the majority of my damsons to hucksters bound for Columbus or farther south, and I also do some trucking to the south. Mining sections are a good outlet.

Reine Claude is my best seller in the orchard, outside of the prune class. It is not a good "city" plum as there are several other green gage types of inferior quality on the market and the average city consumer does not know which is the good one.

In a shipment of nursery stock which I purchased in 1918 were some Hudson plum trees. The fruit of these is very good and sells well to both hucksters and consumers.

Grand Duke, though not sweet, is one of my best sellers. Being large and attractive, hucksters and commission houses buy them readily. The tree is subject to body trouble,

(Continued on page 25)

INTO THE FUTURE WITH EASTERN CHERRIES

By CARL G. WOOSTER

OUR experience as cherry growers is very closely associated with the development of the industry in Wayne County, New York. About 1900, my father purchased a farm of 176 acres near Lake Ontario, which had on it at that time about 80 acres of apples and one acre of Napoleon sweet cherries.

For many years the returns from the one acre of sweet cherries could be depended upon to pay all the taxes on the farm. The cherries in those days were sold on the fresh fruit market. During the next few years the canning industry developed and with it came the demand for red sour cherries. Later the freezing process was developed, and, more recently, the famous Maraschino process for sweets and also sours.

Prices were high for cherries and the demand exceeded the supply. Trees were set by the thousands, many of them without regard to soil requirements, nor to the limiting factor of frost protection which is afforded by our Great Lakes to a restricted area.

During seasons of favorable weather, many of these marginal orchards produce a crop and share in the low price paid for cherries. In less favorable years they do not bear. While the price level of cherries has dropped in the last few years, a more important factor in determining the profit in cherry growing is the ability of an orchard to produce a heavy annual crop. Thus, while some cherries of several varieties will continue to be grown in many parts of the country to meet the demands of local and nearby markets for fresh fruit, nevertheless a rapid readjustment of plantings into a narrower range is taking place.

New York State is the second largest producer of red sour cherries. Wayne County produces about half of all cherries processed in the State, and the greater part of these are grown within two or three miles of Lake Ontario. An analysis of the varieties which our better growers are planting and the cultural methods employed would seem to answer many questions relative to the future of the industry.

About 70 per cent of all plantings today are Montmorency. The tree is hardy, productive, and the fruit meets the demands of the consumer. Early Richmond is only second-class. English Morello is not in demand for processing or freezing. The trees are more fastidious as to soils, require heavy feeding, and the foliage is very susceptible to leaf spot.

There is some increase in the plantings of sweets due to the growing demand for Maraschino cherries. Napoleon, sometimes called "Royal Ann," is most popular at present. Windsor and a few Yellow Spanish are being set as pollinators. The Napoleon will crack if rains occur at harvest time. Yellow Spanish is not as susceptible to cracking, and can usually be harvested after Napoleon. Windsor is somewhat later than either Napoleon or Yellow Spanish, but must be harvested before reaching full maturity if it is to be bleached for Maraschino purposes. Windsor is a hardy tree and bears abundantly when cross pollinated. It is also a very good cherry for the fresh fruit trade.

Schmidt should be mentioned in reference to fresh fruit. It is not surpassed in this respect, and does not ordinarily crack. It is somewhat slower in reaching bearing age, and is not acceptable to the Maraschino trade.

In selecting a site for the cherry orchard, the naturally well-drained deep soils of porous nature are best. Cherry trees will not tolerate wet soils, and while tile drainage does help somewhat, nothing equals good natural drainage. Good air drainage should also be given consideration.

Montmorency, as well as the sweets, should be budded on Mazzard rootstock. The trees grow larger, are thriftier, bear heavier, and live much longer than on Mahaleb. We sometimes plant sours on Mahaleb when they are to be used as fillers, and for this purpose they do very well.

Montmorency on Mazzard roots, planted in good soil, should be set not less than 20 by 20 feet, and sweets not less than 30 by 30 feet. Some of our best Montmorency orchards are 24 by 24 feet on the square. These distances facilitate spraying, cultural, and harvesting operations, without bruising and destruction of

(Continued on page 30)

The author inspecting a tree in a 25-year-old cultivated New York Montmorency orchard planted on the 20 by 20-foot system. To the right of Mr. Wooster is Elmer G. Butts.

A close-up of the Fredonia grape, taken during 1936 season at New York Vineyard Laboratory. This superior variety was originated by F. E. Gladwin.

POLLINATION

WITH PARTICULAR REFERENCE TO THE GRAPE

By FRED E. GLADWIN
Viticulturist, New York Agricultural Experiment Station

PART II

The cross-pollination and subsequent fertilization of grape blossoms is almost entirely subject to air currents, as they alone disperse the pollen. Bees or other insects play but a small part in the dissemination of grape pollen. Investigations show that grape pollen has been carried approximately 16 feet by gentle to fresh air currents, while sticky screens placed 24 feet distant from the pollen-bearing vine used in the tests failed to show any trace of pollen adhering to them.

These tests would indicate that if other varieties are to be interplanted for the purpose of cross-fertilizing grapes, the pollen-bearing vines should not be over 16 feet from the variety to be served. Further, the pollinators should literally surround the self-sterile and imperfectly-fertile varieties so that the full advantage of changing winds may be had.

Repeated tests have shown that many varieties may be made to bear more compact clusters through the artificial application of viable and compatible pollen. Concord and Niagara, which normally set satisfactory clusters, have been made to yield more berries per cluster when hand pollinated with pollens from other varieties. Butler and Lindley, two imperfectly-fertile varieties, were made to produce compact to very compact clusters when viable pollens were applied by hand.

In early work, the pollen was applied by two methods: either fresh blossom clusters of the pollen-bearing variety were dusted over the clusters of the varieties mentioned, or the blossom clusters were taken from the pollen-bearing vine, dried, finely pulverized by rubbing through the hands, and when a sufficient fining had been obtained, the powder, which included much pollen, applied to the blossoms of the varieties to be cross-fertilized as soon as the stigmas of the latter were seen to be receptive. For purposes of application, fine camel's hair brushes are very satisfactory. This method of cross-pollination is entirely practical on a small scale as in the home garden, but its application in a commercial way is not justified because of its time-consuming labor.

The following varieties (now quite generally grown) are strongly self-fertile: Clinton, Concord, Catawba, Delaware, Agawam, Diamond, Niagara and Worden. Some of the self-sterile and imperfectly self-fertile are: Barry, Brighton, Herbert, Lindley, Eumelan, Salem, Wilder and Vergennes. It has been stated before that most self-fertile varieties are greatly improved through cross-pollination, but for the self-sterile varieties cross-pollination is absolutely necessary to insure the production of marketable clusters.

Pollen that matures before the stigmas are receptive may be dried, and if kept dry, held in good viable condition for several days, and sometimes a few weeks. Thus if both essential elements, ovules and pollen, do not reach the fusing stage coincidentally, pollen that matures before the stigma is receptive can be kept until such time. Since many varieties produce very viable pollen, there should be no difficulty in having an ample supply available throughout the entire range of blooming, from those that bloom very early and those that come to blossom very late.

Throughout all of the work in cross-pollination there has been one outstanding pollen-producing variety which has furnished pollen for most of the artificial applications. This variety is a male vine, hence sets no fruit. It was planted because of its possibilities as a graft stock. It annually produces a mass of very large blossom clusters, and it is one of the few that is decidedly fragrant. However, this pleasing odor attracts no bees and hence its pollen which is produced in great abundance is entirely disseminated by air currents.

For several years this variety has been used in the breeding of new grapes, but all of the seedlings have been males. All of the progeny have thus been indelibly stamped with the characters of the male parent. These trials indicated that here was a most viable pollen, and such it has proven to be whenever it has been used to improve the setting of varieties that ordinarily set straggly clusters.

The variety is listed as "Aramon crossed with Rupestris Ganzin No. 1." It can be found in most collections of grapes wherever any work with grape grafting has been done. It propagates readily from cuttings and grows quite vigorously. A few vines will furnish pollen sufficient to cross-pollinate several hundred vines. When it is planted not over 16 feet in any direction from a variety that is self-sterile, good results may be obtained without hand application.

During the past year pollen from "Aramon X Rupestris Ganzin No. 1" has been applied to the blossoms of a self-sterile variety, Eumelan, by means of a small hand duster such as is ordinarily used in dusting plants for insects and diseases. Eumelan is a variety highly prized in the manufacture of wine, but because of the poor setting of its blossoms it is but little grown.

As fast as the blossoms of this male variety opened, the clusters were picked from the vines, placed on screens in a room free from air currents and thoroughly dried. They were then pulverized, placed in tins and sealed. Two weeks later this pol-

(Continued on page 35)

PARAFILM ? PLIOFILM ? PHENOTHIAZINE ?

By E. G. K. MEISTER

NEW names and new products are constantly appearing in the business of horticulture. These new names are confusing to fruit growers and, being technical, are difficult to remember. The successful grower, however, is usually the first to apply new ideas and materials. He keeps an accurate record of new things that come to his attention and seldom depends upon his memory when a problem arises.

A part of the library of every successful grower is the annual Directory and Buyer's Guide Edition of AMERICAN FRUIT GROWER. It contains a complete index of anything and everything needed in orchard work. Many new products will appear in the revised edition, which is now being compiled and will be published in June. Such problems as the following need no longer puzzle fruit growers:

★

"Sorry, boss, but we can't go ahead with the spraying until we get a new nozzle for the gun. The old one's given out. Who makes the XX model?"

★

"Now that I've decided to build a cold storage after hearing so much on the subject at the last state horticultural meeting, wonder where that blower type refrigeration unit can be obtained."

★

"Let's see, what was the name of the company handling the new type pruning shears I saw demonstrated? Wish now I'd written down the name and address, so I could send for a pair."

YOU'LL FIND ALL THE ANSWERS IN THE COMING ANNUAL JUNE DIRECTORY EDITION AMERICAN FRUIT GROWER

How many times have you started your day with questions like those above puzzling and perplexing you? And haven't you wished every time that you had a handy buyer's guide to give you just the information you needed?

Another feature of the June Directory Edition, invaluable to all growers, is a complete and up-to-the-minute treatise on cold storage for the fruit farm. Cold storage of fruit was first attempted by Seneca, when ancient Romans collected snow from the mountains. Alexander the Great likewise dug trenches which were filled with snow and covered with straw and twigs to preserve the perishable fruits of that time.

Refrigeration by artificial means began in 1825 with the development of an air pump to extract air from water. Early expensive machinery has been improved, simplified, and standardized, reaching its highest development in the small household electric refrigerator. Mechanical refrigeration provides growers with cold storages which are a sure way to high fruit prices.

"How to Convert a Common into a Modern Cold Storage" will be discussed in detail in the June Directory number. Another article deals with how to build a 5,000-bushel cold storage. Experienced authors will give specifications, construction details, and plans for building and equipping such a structure.

The story of modern mechanical refrigeration for fruit growers holds much of interest and value to growers.

WATCH FOR THE JUNE ISSUE CONTAINING COMPLETE COLD STORAGE DATA

APS

A PAGE CONDUCTED IN THE INTERESTS OF THE AMERICAN POMOLOGICAL SOCIETY

PLANT WITH CARE—AND ADVERTISE

DECIDUOUS fruit growers in all sections of the United States and Canada are facing a new season with considerably more confidence than was manifested a few years back. The deciduous fruit industry as a whole marketed its crop for more nearly satisfactory prices than has been the case for some time. Apple prices have ruled firm and upward most all the season so that those regions and growers in particular who were fortunate enough to have a crop have felt the influence of a better price.

There is a feeling of optimism among apple growers. The number of bearing and non-bearing trees has been greatly reduced, and the surpluses of former years are not likely to menace the security of the industry for a number of years. There is a feeling that apple growers are now due for a series of years of relatively good prices.

Such a feeling, however, may again promote overplanting of the kind witnessed 20 years ago. Planting at this time is desirable and necessary to stabilize the industry, but careful observers feel the amount of plantings should be only large enough to make the acreage replacements which are needed to keep the supply abreast of the prospective demand.

The various institutes and the advertising campaigns which have been organized in various regions have in a few short years made a real impression on the consuming public. Such work should proceed with increased energy as experience indicates what are the most effective methods. Apple advertisers now have an increasing amount of authority for proclaiming the unusual health-giving qualities possessed by the apple, and failure to capitalize upon the health appeal would certainly be a serious mistake.

Fruit growers should think this matter through carefully, and support to the fullest extent the work of the apple institutes. The citrus growers have done a commendable piece of national advertising, and, as a result, have been able to market increasing supplies of citrus fruits every year. Apple growers can well afford to follow suit and should deliberately set about not only to hold their present domestic market, but to expand it. Even though better times for the fruit grower seem just ahead, no effort should be spared to maintain the gains already achieved through the instrumentalities already at work.

ANALYSIS OF ORCHARD MANAGEMENT

PROF. A. H. TESKE, extension horticulturist, Blacksburg, Va., presented a clear-cut analysis of "The Orchard Management Program for 1937" at the annual convention at Roanoke. This thoughtful paper dealt generally and specifically with many angles of fruit growing. Some pertinent paragraphs are herewith presented because of their timely value:

With a reduction in the number of apple trees and a decrease in both total and commercial production, and with greater stability in the industry, the apple grower today still finds it difficult to market this reduced supply at satisfactory prices except in years when there is an unusually short crop such as we had this past year. Growers may well inquire as to the reasons. Why is it so hard to dispose of their fruit at fair prices in such crop years as we had in 1935?

A part of the answer can be found in the fact that up to the time of the depression more than 16 per cent of the commercial apple crop of the United States and from 40 to 60 per cent of the commercial apple crop of Virginia went into foreign markets.

Again, while we have been pulling out apple trees by the millions, other countries have been increasing their plantings so that, although apple production in the United States is showing a downward trend, world production is on the increase.

Another reason why apple growers are having trouble in marketing medium to large crops at satisfactory prices is that production of competing fruits is on the increase. This is especially true of oranges and grapefruit. The production of these fruits is already so large that during the past three crop years considerable quantities of oranges have been withheld from the fresh fruit markets because they would not pay handling charges. Increased quantities of grapefruit have also been going to the canneries each year. Prices of citrus fruits are expected to go lower as production increases.

As prices of oranges and grapefruit dip to lower levels, it can be expected that the citrus industry will launch a more vigorous campaign to increase the consumption of these fruits. All of which means that in the future the apple industry must be prepared to meet stronger competition.

With prospects for an increase in the world's supply of apples and other fruits, with foreign markets lost to a large extent and little hope of a return to the good old days of a free and open door, and with stronger competition from increased citrus supplies for the consumer's dollar in the domestic markets, the situation in which the apple industry finds itself is entirely different from that of the late '20's. It calls for a further adjustment in the business of fruit growing.

I believe that most apple growers will agree that it takes a well fed, vigorous and healthy tree to produce a good crop of quality fruit, and that we cannot expect much from broken down, weak and sick trees. And is it not true that the apples that usually come from such trees lack size and color? And is it not the fruit from such trees that increases the amount of low-grade fruit which, when dumped on the markets, slows up the apple movement and lowers the prices of the better grades? Why spend time and money on pruning, spray materials and fertilizers to coax these poor trees along, when, as a general rule, they lose money for the grower and make his marketing problems more difficult?

As the first step in the management program for the coming year, I would suggest taking out such trees. This would also apply to trees that are planted so close that there is excessive crowding at the expense of satisfactory yields.

With the weak, sick and partly dead trees out of the way, the next question that should be of immediate interest to the apple grower at this particular time is that of fertilization. Growers should bear in mind that we had a short crop in 1936, and that there is a heavy set of fruit buds for the 1937 crop. If there is a big crop in 1937, prices are likely to be lower.

Some growers have already made up their minds not to use any fertilizer on their trees this year. Many have asked the question as to what would be the best fertilizer to use.

This is one of the years when the grower cannot afford to omit the fertilizer application to his trees. Best results cannot be secured from a hit and miss fertilizing program. The only thing apple growers have to sell is the raw materials of the soil, manufactured into plant foods by the leaves of their trees and transformed into a usable product, in this case apples, for which consumers are willing to pay a price. If apple trees are to function properly and efficiently, they must be supplied with the materials which go to make for performance. They must be fed. And, within limits, the more raw materials that are put through the factory—that is, the leaf surface of the apple trees—the larger will be the output of that factory.

We know that beginning with the swelling of the buds up through the blooming and fruit setting period, apple trees require large amounts of nitrogen. And, at that early season period, nitrates are less plentiful in the soil. In addition to the nitrogen requirements for blooming and fruit setting, the trees need a good supply of nitrogen to develop a good dark green leaf surface capable of manufacturing food later for the development of fruit and the formation of fruit buds.

During the 1936 short crop year, the apple trees formed a large number of fruit buds. This means that this heavy set of flower buds will use up much of the supply of reserve food in blooming this coming spring. The competition for the reserve food between the heavy set of flowers and the first leaves will be so strong that the early leaf surface is likely to be so small that it cannot manufacture enough starch foods to meet the early season's growth requirements and at the same time provide for a surplus to form fruit buds for the next year. This means that unless we do something to increase the reserve food supply, there will be only a small number of fruit buds formed for a crop in 1938.

In my opinion, soil erosion and the lack of organic matter in our orchard soils are the two most important problems of the apple industry at the present time. The grower whose orchard management program is a satisfactory answer to these problems and nitrogen requirements of his trees will have gone a long way toward solving the problem of increased yields.

H. L. Lantz
SECRETARY

"BLACK LEAF 40"

Kills Aphis and Other Insects

BLOSSOM TIME is promise time—foretelling the possibilities of your crop. But if these promises are to be fulfilled, you must aid in guarding against attacks by Aphis, Red Bug, Leaf Hopper and other insects which damage foliage and cause dwarfed or gnarled fruit. "Black Leaf 40" used alone or with other standard sprays kills these pests—both by contact and by fumes.

FOR MORE EFFECTIVE CODLING MOTH SPRAYS: Fortify lead arsenate or "summer-oil" sprays with "Black Leaf 40". Lead arsenate kills the larvae after they eat, "summer-oil" kills the eggs. "Black Leaf 40" kills mature eggs and larvae, and also adult moths.

"BLACK LEAF 40" IS EASY TO USE: Concentrated, effective, easy to mix and apply. Of vegetable origin—it is not caustic—does not "burn" man, horses, trees or crops. Volatile, it "fumes off" (evaporates) from foliage or fruit. "Black Leaf 40" is sold by spray material dealers everywhere.

3733

TOBACCO BY-PRODUCTS AND CHEMICAL CORP. INCORPORATED

LOUISVILLE KENTUCKY

STATE NEWS

FROM NEAR AND FAR

ILLINOIS—Fruit crop outlook for Illinois: Promising, particularly for apples, peaches and pears. Anticipated 1937 crop below crop of 1935, however, due to severely cold winter of 1935-36 followed by intense heat and drought of last summer which killed a large number of apple and peach trees.

Summer apple territory in Johnson, Union and Jackson counties will have only a reasonable crop, many orchards having a very light bud set.

Peaches in the territory south of Carbondale were severely injured during the winter and only a partial crop is expected.

Strawberries do not promise a heavy yield in any section of the State.

Peaches, apples and pears in Centralia area have encouraging outlook. Peaches in most orchards have survived the winter in sufficient numbers to promise a full crop.

Western and northern Illinois are due a crop of average production.

Present indications: Illinois will have a fruit crop distributed over entire producing area, perhaps about 80 per cent of 1935 production.—JOE B. HALE, Sec'y, Salem.

TENNESSEE—Poisoning, burning, electrocuting, trapping, mashing, and starvation are some of the methods used to destroy codling moths and their larvae.

N. N. Barnett of Troy, Tenn., tried out another common means of ending life—

drowning. He found a number of worms spun up in a leather and canvas backband, which had been discarded in his orchard. He threw it into a barrel of rainwater and after three days under water, found all the worms alive. He left it in the barrel for two weeks more and reports that many of the worms were still alive.

As far as we know, Mr. Barnett is not a member of the Tall Story Club.

On Lincoln's Birthday, 27 members of the Greenfield (Weakley County) Fruit Growers Association gathered for their annual meeting. Vice-president R. R. McUmber told the writer this association has operated for 40 years under but three presidents. They employ a sales manager, and one man has held this position for 20 years. We believe this remarkable record reveals the fine character of its members.

Denton Fly, Milan, 1936 champion strawberry grower, won further honors and a $500 cash award, given by the *Commercial Appeal*, Memphis newspaper, for the best all around farmer in Tennessee, Arkansas and Mississippi area covered by its circulation.

Purpose of the award was to encourage diversification of crops and required keeping of account records. Mr. Fly's records showed a profit on 14 out of 16 crop projects.—A. N. PRATT, State horticulturist, Nashville.

MINNESOTA—Grower reports indicate most orchard trees and small fruit plants appear to be coming through the winter in good condition.

Although the area around Minneapolis and St. Paul is still very deficient in moisture, unusually heavy snowfall with comparatively little frost in the ground in the rest of the State gives promise of favorable planting conditions for the spring of 1937.—J. D. WINTER, Sec'y, St. Paul.

CALIFORNIA—Enterprising San Joaquin Valley farmers will merely grin when you tell them, "You can't eat cactus!" For they are now growing a cactus crop that makes real money for them. The product is prickly pears.

Each row of cactus reaching across a 30-acre field, for instance, pays $250 to $300 annually.

The pears are grown at the end of the big heavy cactus leaves, and a part of the latter is cut off when harvesting. This practice, it has been found, keeps the pear in good condition for a month or two.

The fruit is eaten sliced, with sugar and cream.

One American authority says Americans contract some 100,000,000 colds every winter. Capitalizing on such catastrophe, California Fruit Growers Exchange conducted an intensive seasonal campaign to sell lemons for "Hot Lemonade for Colds."

SOUTH DAKOTA—The 32 seedling apricots which Dr. N. E. Hansen of S. D. State College collected in 1924 from Old Man Winter's headquarters in eastern Siberia—where the temperature ranges from 47 to 50 degrees below zero—have been bearing for several years. Dr. Hansen feels these new apricots, the fruit of which is yellow, somewhat smaller than the apricots of commerce, and makes delicious preserves, will stand the extreme conditions of the Dakotas, Minnesota, Montana, Manitoba and Saskatchewan.

PENNSYLVANIA—The morbid facts back of the serious winter injury suffered by Pennsylvania fruit trees in 1933-34 and 1935-36 were disclosed by Dr. R. D. Anthony of Pennsylvania State College at the annual meeting of the hort association. Among the factors were in-

adequate soil drainage, soil fertility, and heavy bearing. Dr. Anthony bases his facts on a tri-state survey made the past season.

Recently a number of cases have been observed where the heavy drain of a large crop and its effect upon the degree of winter injury is evident. In a block of Stayman trees carrying a heavy bloom in 1935 a satisfactory crop was produced except upon two rows of trees that were not covered during the critical scab period due to sprayer trouble.

The two rows not fruiting in 1935 showed no winter injury in 1936 and produced a maximum crop whereas the remainder of the trees carried a very light crop and suffered severe injury.

A second orchard of Baldwins carried a heavy crop in 1935. The fruit on two and a half rows of trees was thinned the latter part of June. In 1936 the trees upon which the crop was limited in 1935 by thinning appeared to be normal while the unthinned trees were seriously damaged, about 50 per cent passing out of production.

A third case is that of an orchard comprised of Delicious and York Imperial receiving heavy applications of nitrate. Here again the trees carrying heavy crops in 1935 were damaged to such an extent that removal is the only course to follow.

In the past the practice of fruit thinning was emphasized as a means of improving the quality of the pack but in some Pennsylvania orchards conditions would indicate that fruit thinning might play a more important role in maintaining tree vigor and long-time production.—J. U. RUEF, Sec'y, State College.

(Readers are referred to Dr. Anthony's and Dr. R. H. Sudds' article, "Low Temperature Injury to Orchards," January issue.—Editor)

WISCONSIN—All northern states patiently await the outcome of the tests being conducted with Crath Carpathian English walnuts (introduced from Poland), seed of which are again being distributed this spring for trial by Wisconsin Horticultural Society.

So far the tests have been successful. Seedling trees have come through the winter in good condition. Older trees have survived our severest winters. None of the trees in the U.S., however, have borne any nuts as far as we can determine. Trees in this country should produce at about seven or eight years.

Interest in new fruit varieties is increasing. Many older varieties have been discarded for the new. Wisconsin growers are becoming more favorably impressed with Cortland and Kendall to lengthen the season of McIntosh, the State's favorite apple.

Melba has become a standard early variety for Wisconsin. Beacon is replacing Duchess in Minnesota and is being widely tested in Wisconsin this year.

It is indicated that Haralson will probably replace N.W.Greening as a cooking apple and be planted extensively in sections having severe winters.

A number of Wisconsin Hort Society members are testing the new hardy apricots introduced from China by Dr. N. E. Hansen of South Dakota.

In the strawberry world Beaver and Premier continue to retain their popularity in commercial sections, although hundreds of growers are experimenting with Dorsett, Fairfax, and Catskill. These varieties look very promising and will probably replace other varieties on soils and under conditions where they can be most successfully grown.

Rather surprising differences in results are being noted between different varieties depending on soil conditions and locality. For example, Beaver has been a failure in many sections of the U.S. but continues to be a

(Continued on page 22)

GEORGIA PEACH ORCHARD'S COVER CROP

turned under on time!

While the fertilizing value is greatest—and before it wastes moisture needed by the coming peach crop—this rich cover crop of Austrian Peas is turned into the soil.

No worry over traction—the Twenty-Two's broad tracks keep their sure footing even in damp, slippery cover crop. No time lost working over grades or side-hills—this rugged tractor is balanced to keep its tracks on the soil their full length. And the full-pressure-lubricated engine develops heavy-duty power to team with non-slip traction.

With the 6-foot, offset cover crop disk, this "Caterpillar" Twenty-Two Tractor thoroughly cultivates the rolling 85-acre peach orchard *in only five 10-hour days.* And using only 2 gallons of low-cost fuel per hour!

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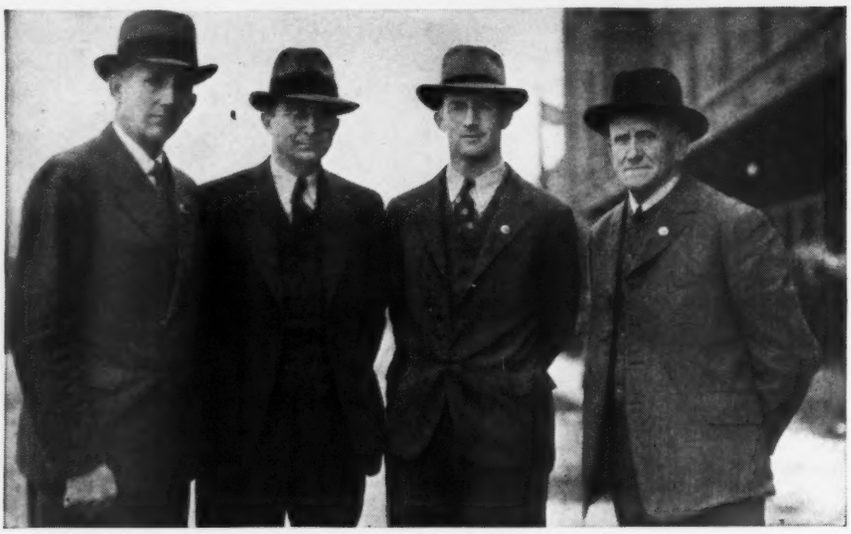
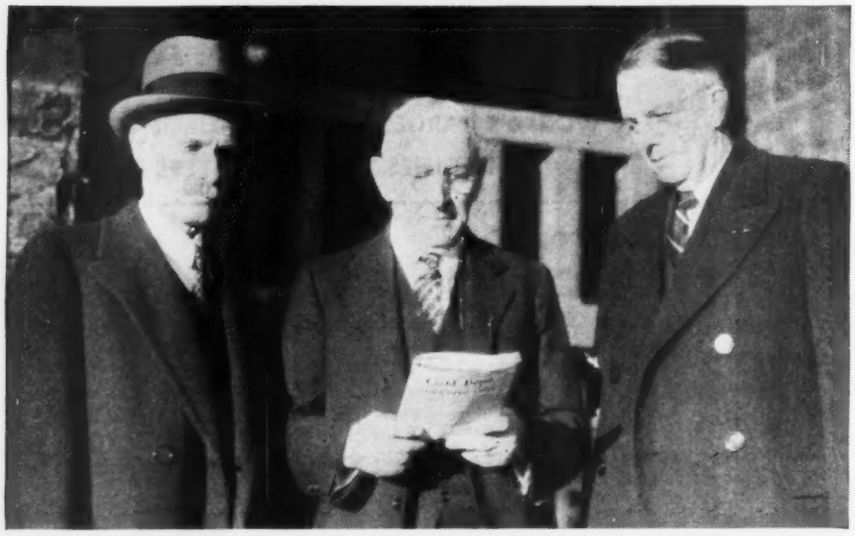
Camera!

H. L. Lantz, left, secretary of the American Pomological Society, pauses to chat with W. S. Campfield, center, secretary of the Virginia Horticultural Society, and G. Leslie Smith, president of Illinois Horticultural Society, at the Virginia meeting.



Left to right: Francis G. Reiter, fruit grower of Mars, Pa.; J. U. Ruef, Pennsylvania State College extension horticulturist and new Pennsylvania association secretary; George A. Goodling, Loganville; and C. B. Snyder, Ephrata, Pennsylvania, Horticultural Association treasurer, look directly at the American Fruit Grower camera for this "shot" at the annual meeting of the association.



H. W. Miller, left, veteran West Virginia fruit grower, and J. B. Whisnant, right, prominent Georgia fruit producer, look over the program of the Virginia meeting with Dr. H. P. Gould of the U.S.D.A.

STATE NEWS

(Continued from page 20)

very profitable variety in certain sections of Wisconsin. Hence we urge growers to try different varieties and adopt those best suited to their soil.

Fruit growers are being asked to co-operate with beekeepers in an effort to obtain a large appropriation to drive foul brood (disease of bees) from the State.—H. J. RAHMLOW, Sec'y, Madison.

INDIANA—Practically all small growers of apples have been sold out for many weeks and larger growers had comparatively few apples still to be moved out of storage as we entered the last half of March.

Indications at that time pointed to a very heavy apple bloom throughout the State.

Moisture conditions in orchards are tops. Even with less-than-average rainfall the next few months, deeper soils are expected to carry an adequate moisture supply farther into the season than in 1936.

Considerably fewer orchards are operated under clean cultivation today as compared with a few years ago. Erosion problems, moisture-holding capacity, soil depths and soil temperatures have all contributed toward this gradual change of soil management throughout the State.

Free to Hoosiers is 36-page Bulletin No. 414, edited by Clarence E. Baker and entitled, "The Relation of Nitrogen and Soil Moisture to Growth and Fruitfulness of Apple Trees Under Different Systems of Soil Management."

Comparisons are given of commercial apple production on clean cultivated plots as compared with blue grass and alfalfa-sweet clover sods, both with and without commercial fertilizer applications.

Purdue Agricultural Experiment Station, West Lafayette, will send the bulletin upon request.—EVERETT WRIGHT, Sec'y, Lafayette.

MASSACHUSETTS—The 43rd annual meet of Massachusetts Fruit Growers Association in Worcester was warmed up with a jolly attendance of over 500 fruitmen. Convention was held in co-operation with the Union Agricultural meetings sponsored by the State Department of Agriculture.

Discussions on orchard heating brought out the fact that heat is more important than smudge and that fruitmen should experiment with their particular situation before they go to too great expense in trying to prevent frosts in their orchards.

Fruitmen who have tried orchard heating stated further it was necessary to keep constant watch on the temperature and to have everything set for lighting the fires when the temperature got down to 31 degrees F, that being the point at which fires should be lighted.

The association went on record as objecting to renaming of apple varieties to avoid confusion. Standardization of varieties and variety names certainly should be maintained. If we were to add, say, one name a year to a variety, by 1950 the situation would be comic.

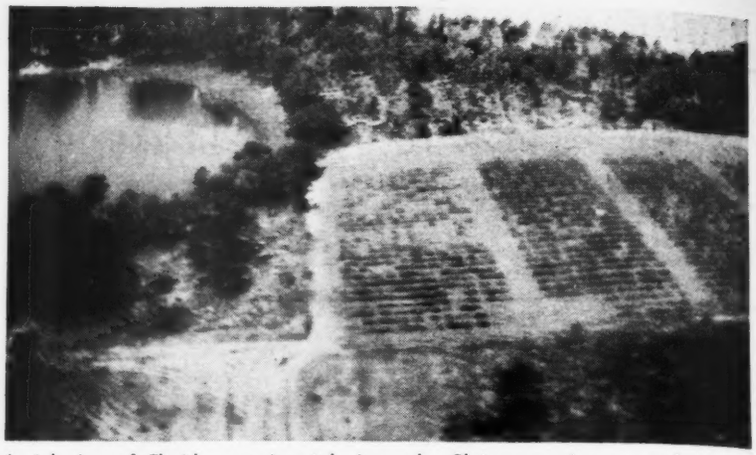
McIntosh is still New England's No. 1 apple, according to Dr. Richard Wellington, Geneva (N.Y.) Experiment Station.

Shining light of the fruit show: Keown Orchards of Sutton. This orchard took both sweepstakes prizes, one on the bushel package class and one on the plate class.—WILLIAM R. COLE, Sec'y, Amherst.

WASHINGTON—A bill providing for a tax of two cents per cwt. on apples to support a national advertising campaign was recently passed by Washington legislators.

This is the same assessment as has been paid by members of Washington State Apples, Inc., growers' organization which launched industrial advertising on Washington apples on a voluntary basis this season.

It is expected the growers' organization will be taken over by the State to administer the new program.



Aerial view of Florida experimental vineyards. Plots appearing as roadways are actually defoliated check plants.

GRAPES

FLORIDA TESTS

Striking results of a grape spraying experiment are shown in the above illustration. This work was conducted by Kenneth W. Loucks at the Leesburg Field Station of the Florida Agricultural Experiment Station. Of the many materials tested for the control of the grape rots, Bordeaux proved best. The tests were conducted over a period of years and the results have proved of untold value to Florida grape growers.

BERRY MOTH CONTROL

Entomologists of the New York State Agricultural Experiment Station at Geneva have warned grape growers to be on the lookout for signs of the grape berry moth in their vineyards. Periods of severe cold weather when the ground is not covered with snow usually account for the destruction of large numbers of the overwintering larvae of the berry moth, say the specialists, but in some vineyards protection by snow may have allowed a sufficient survival to make possible troublesome infestations. Grape growers are urged, therefore, to take the necessary measures to combat this pest before it is too late.

"Examine the blossom clusters frequently until the grapes are the size of small peas, for any signs of webbing by the larvae of the grape berry moth," says Prof. F. Z. Hartzell, New York station entomologist. "The young worms spin webs in the clusters which are usually readily detected. If the insects are present in any number, a thorough application of spray should be made immediately after the grapes have set, or at least by the time they have attained the size of buckshot.

"Every effort should be made to eliminate the pest just after blossoming, as later applications will introduce spray residue problems. Efficient control can be secured by a thorough spraying of the young berries."

Experiments in the eastern grape sections have shown that the berry moth can be controlled by spraying with arsenate of lead at the rate of three pounds to 50 gallons of Bordeaux mixture. One application of this spray is made shortly after fruit setting, another about 10 days later, and the last when the grapes are about half grown.

EARLY FRUIT BEARING

A method whereby seedling grapes of California varieties may be brought into bearing in 18 months, instead of the usual four or five years, has been developed by U.S.D.A. scientists as a means of speeding up experimental breeding work with this fruit.

At the Fresno, Calif., experiment station, Elmer Snyder and F. N. Harmon of the Bureau of Plant Industry have used the simple "T" bud as a means of hastening fruit bearing of promising new varieties.

The seeds are planted about the first of February in a greenhouse flat. A few weeks later, when the plant has come up and a few leaves have started to develop, it is transferred to a gallon can or a six to eight-inch greenhouse pot. By the latter part of May or first part of June the seedling attains a growth of 12 to 16 inches, from which three or four buds can be obtained.

These are "T" budded into vigorous rootstocks or bearing vines in the vineyard. They are wrapped securely with rubber grafting tape and the cane is pinched off at the tip to check terminal growth. A week to 10 days later the shoot is cut back to the bud, leaving some of the original leaves as shade. As three or four buds are inserted in each shoot, the weaker ones are pinched back and only the strongest allowed to grow. These shoots, under the conditions at Fresno, will bear fruit in August of the second year, about 18 months after the original seeds were planted.

During the past year Snyder and

Harmon made over 1,500 "T" buds and about 80 per cent grew successfully. The buds must be shaded during extremely warm weather the first summer. It is also important to cut the shoots back at the proper time, and constant upright training was found to promote more rapid growth.

Although final commercial merits of a promising seedling cannot be decided this early, many qualities, such as color, shape, size and flavor, can be determined at this time, thereby speeding experimental work.

PLUM PRODUCTION

(Continued from page 14)

but is a good annual producer and starts to bear at an early age.

Yellow Egg is well worth mentioning as it is very attractive, good for the roadside market, and has quality that many of the other even less acid ones do not have.

The purple Bradshaw attains good size, is good for eating fresh when ripe, and sells well at roadside stands and to hucksters. Early to ripen, it starts off the plum market. The tree is large and long lived.

I have described varieties I consider most desirable to plant, stressing those in the prune class as my experience and observation convince me these are the superior fruits.

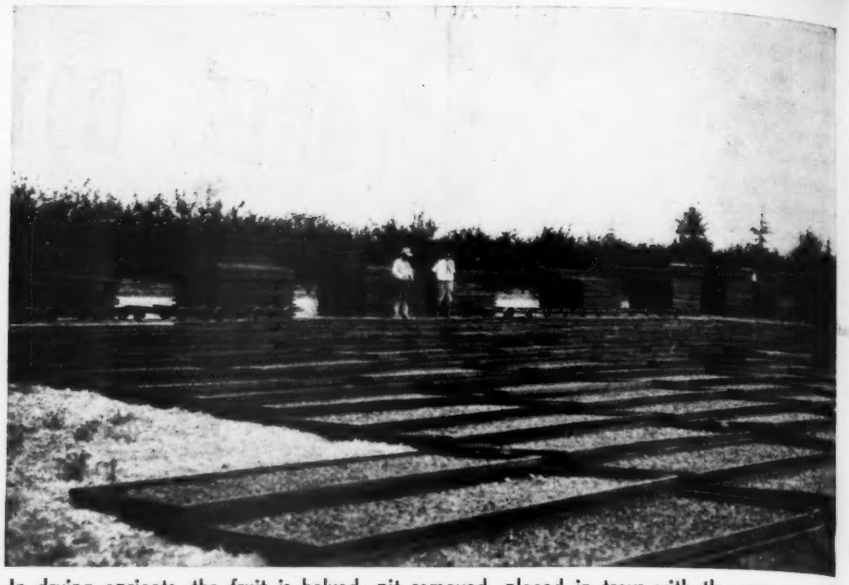
So far as diseases and insects affecting plums are concerned, these are as easily controlled as those of the apple. The trees are subject to scale and occasionally to red mite. Curculio is the worst insect enemy, but sprays applied properly will control it. Leaf spot disease, to which they are susceptible, can be controlled by combining a fungicide with the insecticide.

I began thinning plums years ago, endeavoring to prevent contact of specimens. The clusters hold moisture during wet times and encourage rots. Thinning of plums, however, is not as generally practiced as with larger fruits.

Pruning is done by detailed thinning of the fruiting surface—not by cutting out large branches.

I usually cultivate until midsummer, then sow a cover crop where the trees do not make too much shade, or let the planting grow to native grasses and weeds. Most of the soil is tiled for good drainage. Some of my trees are on sandy soil, but I have found that this type of soil is not as good as heavier land for plums. For fertilizers I have used nitrate of soda, cyanamid, sulphate of ammonia, and manure at different times.

Improved varieties, along with proper methods of pest control and soil management, must be considered by the plum grower if he is to obtain the greatest benefit from his enterprise.



In drying apricots, the fruit is halved, pit removed, placed in trays with the cups up, and exposed in a tight compartment to burning sulphur fumes. After removal from the sulphur house, the trays are spread on the ground and exposed to the sun for one to three days. The trays are then stacked, as shown in the background of above photograph, and drying completed in the shade, which takes another six or seven days. Drying ratio of fresh to dry fruit is about five to one.

APRICOT CULTURE

(Continued from page 13)

in California consider the apricot as probably the most difficult tree and crop to handle. Those who have grown both apricots and sweet cherries are somewhat divided in their opinion as to which of these two fruits requires the greater skill on the part of the orchardist, with the majority perhaps voting for the culture of the apricot as presenting the greatest number of hazards.

The tree itself in most locations presents no great problem, being grown with almost equal success on apricot or peach root, and being adapted to heavier and more poorly drained soils by working on Myrobalan, certain strains of which are fairly satisfactory as a rootstock. The largest apricot trees that I know of in California are on peach roots and are now about 80 years of age. Figure 1 shows one of these trees with a spread of more than 60 feet. This tree has several times produced more than a ton of fruit in a season. Many orchards in California are over 50 years of age and apparently have many more years of profitable fruiting ahead.

Although the trees are apparently thrifty, and long lived even when not grown under ideal conditions, the production of a profitable annual crop may be an altogether different matter.

Fruit buds of the apricot are apparently as hardy to low winter temperatures as are those of the peach, but the blossoms and young fruits are the most susceptible of all deciduous fruits to a few degrees of frost, and in fact at certain stages of development a temperature of 31½ degrees F if continued for an hour or two will cause loss.

During the dormant period temperatures must not be too mild or else the "rest" will not be broken. After unusually warm winters many fruit buds drop rather than opening, thus resulting in a decided reduction in crop. Where irrigation facilities are available, the apricot grows successfully under climates ranging from cool coastal districts to desert conditions. The time of harvest is dependent upon the accumulation of a certain number of heat units, whether secured in 100 or 130 days, a fact explaining the earliness of certain districts. Temperatures of about 103 degrees F and upward during the ripening season cause "pit burn"—a darkening of the flesh around the pit—which spoils the fruit for fresh consumption or canning and lowers its value for drying.

Adequate soil moisture must be present at all times if regular and profitable fruiting is to be obtained. Irrigation facilities are necessary to maintain sufficient new growth and annual crops. From two to eight irrigations per season are given depending upon the district and soil type. Some varieties, such as the Tilton, seem to be less tolerant of drought than others, such as the Royal.

On account of the ultimate size of the apricot tree under suitable soil conditions, it is questionable whether they should ever be planted closer than 24 by 24 feet. All varieties grown are apparently self-fertile and no provision for cross-pollination is necessary.

One-year-old trees are usually planted and headed to a whip at about 30 inches above the ground. Three main branches are selected at the first winter pruning and generally

headed at about shoulder height. At the second annual pruning from five to seven secondary scaffolds are saved without heading. Thereafter, the trees are "thinned" each year so long as adequate replacement wood can be secured without recourse to "heading." Fruit is produced on one-year shoots and short-lived spurs. After the peach, the apricot probably receives the most severe pruning of the various deciduous tree fruits grown in California. In addition to limiting the crop by pruning, hand thinning of the fruit is almost universally practiced.

Bacterial gummosis, brown rot, black heart, and shot hole fungus (Coryneum) are the most serious diseases. Insect pests include the peach root borer, peach twig borer, canker worm, leaf roller, brown apricot scale, and black scale. Except bacterial gummosis, black heart, and the root borer, all these troubles may be controlled by known spray programs. Amputation and scarification, plus a disinfectant, afford some control of bacterial gummosis. Paradichlorobenzene has proved useful against the root and crown borer.

The Royal, an old French variety, and the English variety, Blenheim (Shipley), are most widely planted. These two sorts were undoubtedly distinct varieties as first introduced but have become decidedly confused in more recent years, so that few, if any, can with certainty distinguish between them. Both of these varieties are entirely satisfactory for fresh consumption, canning, and drying.

During the past 30 years a California seedling, the Tilton, has been planted rather widely in the interior valleys. It is larger than either Royal or Blenheim and produces heavy crops under ideal conditions. Its quality for either drying or canning does not equal Royal or Blenheim.

The Moorpark, another old English variety, is of the highest quality for all purposes but has almost passed out of cultivation on account of shyness in production. The so-called Wenatchee Moorpark is popular in Washington and some of the other western states.

The Derby, Stewart, Newcastle, and Wiggan are occasionally planted in early districts for fresh shipment. The latter two are rather soft and must be harvested too firm for best quality. The Derby and Stewart closely resemble the Royal and are often shipped as such.

Apricots are generally picked by hand, proper maturity being determined largely by color. For distant shipment a full straw color and complete freedom of flesh from the pit is the maturity criterion; for the cannery and dry yard, the fruit is left on the trees until much softer, being most mature for drying. After picking there is no increase in sugar content.

In California, apricots for the east-

(Continued on page 35)

CONTROL OF CHERRY AND PLUM BLACK KNOT

By M. B. CUMMINGS
University of Vermont

BLACK KNOT disease is not new but is a very troublesome and recurring one. It often appears in great abundance on uncultivated plums and cherries, and spreads to cultivated ones.

The accompanying illustration shows a tree that is heavily infected with black knot. This is an extreme case and a tree in this condition should receive immediate attention. In this instance, it would not be worth while to try to save the tree by cutting out affected limbs or individual knots. The tree is too much knotted. It would be better to cut the tree off at the ground and put the whole specimen on the bonfire.

But many times one may find only a few knots in a plum or cherry orchard or on trees in the fence row or in the garden. Such trees can be cleared of black knots and the trouble prevented from spreading to other cultivated trees. If this work is done before the season opens and before the spores have spread, good control should be secured. Cut the limbs one foot below the knot so as to remove all infected tissue. Black knot extends down the tissue farther than is apparent on the outside.

Black knot disease of plum with swellings all over the tree. If the knot is cut off and burned before the season opens, spread of the trouble is forestalled.

Peach thinning, as practiced by these workers, is an important part of every peach grower's cultural program.

PEACH THINNING

(Continued from page 11)

The first extends up to about the time the pit begins to harden at the tip. During that time the stone reaches its full size, although the flesh is as yet quite thin about it. During the second growth period the enlargement in the peach as a whole is relatively slight. This lasts in Elberta up until five weeks or so before harvest. The last growth period is sometimes spoken of as the "final swell" and it is during this period that the effects of thinning are most noticeable.

Before passing to a more detailed consideration of the place of thinning in the orchard program, it might be well to note some general considerations regarding this practice. These have all been noticed previously by practical men and need only to be mentioned here in order to place them in the picture. To begin with, it is common knowledge that shoot growth is reduced on overloaded trees. Since fruit bud formation is so intimately connected with growth, unthinned trees have sometimes produced no more than 10 per cent as many fruit buds as the thinned trees. The color of the fruit is also increased by thinning, and the time of ripening is evened up. A reduction of the crop load can completely avoid breaking, except possibly with the older trees where winterkilling has injured the heartwood so that the scaffold limbs are brash. In this case bracing is necessary. An important aftereffect of thinning is found in the greater hardiness of both the tree and the fruit buds.

Thinning needs to be considered also in relation to nitrate applications, pruning, age of tree, type of growth, etc. The relationship between pruning,

(Continued on page 32)

TABLE I. The relation between thinning, nitrating, and pruning in controlling size. Elberta season of 1931.

Orchard	Treatment			Age of trees	No. of trees	Yield of fruit in pounds of the different sizes					Av. yield per tree (lbs.)
	Nitrogen	Pruning	Thinning			0-1¾"	1¾-2"	2-2¼"	2¼-2½"	2½"-up	
1. C. F. Heaton New Burnside	3 lbs. Sulphate of ammonia	Regular orchard mod. heavy	None	13	5	172	179	23	0	0	374
2. C. F. Heaton New Burnside	3 lbs. Sulphate of ammonia	None	None	13	2	10	93	183	101	1	388
3. C. F. Heaton New Burnside	3 lbs. Sulphate of ammonia	Heavy in '30 & '31	None	13	3	83	183	97	12	3	378
4. M. J. McBride & Son, Villa Ridge	5 lbs. Nitrate of soda	Moderately heavy	None	14	1	8	152	222	40	0	422
5. C. F. Heaton New Burnside	None	Regular orchard mod. heavy	5"	14	10	1	13	73	104	18	209
6. M. J. McBride & Son, Villa Ridge	5 lbs. Nitrate of soda	Light cuts '30 & '31	5"	14	11	0	30	172	171	33	414

EASTERN CHERRIES

(Continued from page 15)

fruit and side branches. Plenty of sunlight is also inducive to stronger growth and the forming of fruit-spurs on the lower branches where we wish to produce as large a portion of the crop as possible.

Annual or semi-annual pruning is recommended, for if pruning is delayed longer than this, the lower branches become shaded and weakened, and much of the bearing surface which will be produced at the top must later be cut away. All cuts are made to laterals growing out and downward, with plenty of bearing surface left throughout the tree. Sweets require much less pruning than sours, but are headed so that they may be picked with an 18-foot ladder. All sours are pruned so that they may be picked with an eight-foot stepladder.

Most of the harvesting is done by women and children, and if trees are regularly pruned, we have gone a long way to insure an ample supply of desirable help at harvest time. Thorough pruning also helps in maintaining a proper size and grade of fruit.

During the early years of the plantation it is advisable to intercrop with such row-crops as potatoes, cabbage, beans or tomatoes. The cultural practices employed in producing these interplanted crops are inducive to rapid development of the trees and their early maturity. After three or four years the orchard may be seeded down, preferably to a legume crop, and by the addition of manure or other mulching materials, maintained as a sod orchard.

Sweet cherries do their best under these conditions, and we find there is much less damage from cracking of fruit in the sod orchards than in the cultivated. Many of our best yielding Montmorency orchards have been down to sod for 15 years without having been broken up in that length of time. The grass which soon becomes a volunteer growth between the rows, is cut twice a season. Very little damage is caused by mice or rabbits to cherry trees. Spraying, harvesting, and all other operations are much easier when the orchard is maintained in sod. The result is more economical production.

Cherries, both sweet and sour, respond to liberal applications of nitrogen. Annual applications of from three to 10 pounds of nitrate of soda, or equivalent, depending upon the age and vigor of the tree, are applied about two weeks before blossom time. In order to maintain production, the tree should make a terminal growth of 10 to 14 inches each year. This growth develops the fruit spurs and forms healthy buds which are more

likely to withstand the frequent low temperatures just previous to blossom time.

The insects and fungous diseases which attack the cherry are relatively few and easily controlled. Leaf spot and maggot, with some attention given to brown rot, constitute about all the enemies of the Montmorency. About four sprays of lime and sulphur with arsenate of lead, three previous to picking and one after, will control these. The sweet cherry has the additional enemy of black aphis, which is easily controlled by the application of nicotine or other sprays made during the dormant period.

The present size of our farm is 1300 acres. The orchard acreage is 550 and is made up of 410 acres of apples, 100 acres sour cherries and 40 acres of sweet cherries. The sour cherry planting is about 90 per cent Montmorency and 10 per cent English Morello. These trees vary in age from two to 29 years, and the planting distance is 20 by 20 and 24 by 24 feet.

We hire bees for the orchard and use about one colony to the acre if pollination is a problem.

Our present plans call for a slight expansion of the sour cherry orchard and Montmorency will be used. We are, however, going to increase the sweet cherry planting, using about one-half Napoleon for the new stock and the remainder about one-quarter each of Windsor and Schmidt.

Manure obtained from our more than 100 head of stock on the farm is used for mulching in the cherry orchard. In addition to this we use fertilizers each year.

My father and brother are also interested in the farm operation. We hire 20 men by the year for the orchard, dairy and general farm work. Our mechanical equipment includes three trucks, seven tractors and 11 sprayers.

I believe the cherry industry needs organization for control of the pack during years of high production, and advertising for increased consumption.

Tree Wax Seals and Heals

Periodical examination of tree trunks may prove to be time well spent. Cracks, crevices, wounds and diseased tissue may be found which should be taken care of promptly. A wound dressing which is said to have healing qualities is now on the market. Graftwax-Tree Healant can be applied at any time and is used also in budding and grafting.

Peachot Crop in Colorado

Two Colorado growers, Gene Hubbard of Orchard City and Fred Coombe of Cedaredge, harvested a novelty crop, peachots, last year. This fruit, a cross between the peach and apricot, is rare, as the trees bear only once every several years.

Two limbs with about the same "leaf surface" which shows the reduction in size from "clustering" but a greater yield.

PEACH THINNING

(Continued from page 29)

nitrating, and thinning has been given some attention in the Illinois experiments. One page from our notebook has been included in Table I, which illustrates what can or cannot be done to the crop through these three variables.

Since the objective in growing peaches is to obtain both size and yield, the data summarized will be particularly interesting from that angle. Of the salient points which may be noted in the table, the unthinned trees in the Heaton orchard (Experiment 1) are of special interest. In this instance the unthinned tree matured an average of 374 pounds of fruit per tree but a large proportion of the crop was below one and three-fourths inches in size. These particular trees matured an average of 3,200 fruits each and with this much of a load it was impossible to size up the crop even though the yield was not excessively high. By way of contrast, the trees in Experiment 6 may be noted. Here the yield was higher but the number per tree was limited. A large proportion of the yield fell in the larger commercial sizes.

The success of sizing up fruit through nitrate applications when pruning and thinning are omitted is illustrated in Experiment 2. In this instance the upper limit of a crop load was reached in the absence of thinning and as a result much of the crop, particularly that in the clustered part of the tree, fell into the smaller sizes. By way of contrast, in Experiment 3, heavy pruning and nitrating were tried without thinning, with a result even more disastrous than in the above. Likewise in Experiment 4 with fairly heavy nitrate applications and with moderately heavy pruning, thinning was omitted. The yield was high, but as in the other unthinned trees, the size was small. In Experiment 5 the crop was limited by both thinning and pruning but nitrogen was omitted. In this instance the fruit set lighter and tended to drop to a greater extent, thus limiting the load to nearly half that of some of the other treatments. In these trees there was a type of growth, generally spoken of as a high carbohydrate growth, which produced an especially fine color in the fruit although the yield was cut. The fruit ripened evenly and was all harvested at one picking.

The general trend of the results in this table will show definitely how these three variables can be used in controlling size. Judgment will be required to direct the type of thinning required under different growth conditions but with experience these variables can all be brought into balance and the stage set each year for a fair yield even if growth conditions happen to be unfavorable.

One more thing now needs to be considered and that is the "final swell." The thinning problem as related to the other treatments, comes to a focus at this time. Experienced growers know how difficult that last week is with a peach crop. Always the possibility of prolonged rainy periods with brown rot and delayed picking have to be considered, to say nothing of the price level. In other words, when shall we pick? If the picking is done too soon, both quality and yield are cut. If done late the quality increases but the shipping radius is shortened. Studies at Illinois station show that a peach enlarges when the

moisture supply is adequate up until two or three days after it starts to become soft. Obviously, then, overloading becomes more acute during the final three or four days than at any other time. This point has been carefully considered at a number of stations and viewed from the marketing angle it seems that peach growers will have to give more thought to the degree of ripening before picking is started.

With a 25-foot planting distance, an average yield of mature trees could easily be placed at 300 to 500 bushels per acre. During the last week if growth conditions are adequate and the crop load not too heavy, peaches enlarge in the neighborhood of one-sixteenth of an inch or more in diameter per day. In other words, expressed in the terms of bushels, the yield increases five to fifteen bushels each day. This fact can be taken full advantage of by careful picking or "topping." Picking too soon may be serious from the standpoint of the bearing of quality upon repeat orders. On the other hand, the time element becomes an important factor where large acreages are involved. When all of these variables are taken into consideration, it requires good management to control the situation. Other things being to our choosing, picking can be gaged by the shipping distance and the market requirement as to ripeness. At best, however, the time is so short, and the time limits so great, that everything has to "click" at harvest time.

There is another aspect to the size problems in peaches which needs to be taken into consideration. My associate in these experiments—R. L. McMunn—has determined that there is about twice as much surface to be peeled in a bushel of one and three-fourths-inch peaches as compared to a bushel of three-inch peaches. And as strange as it may seem, there is more flesh in 50 pounds of peaches of the larger size than in the smaller, partly because there are fewer seeds.

In its final analysis, it will be seen that there are a good many angles to the thinning problem as it is related to the tree condition and the crop load. It would seem that under eastern conditions it would be only fair to set the stage each year for average growth conditions. If the season turns out to be especially dry, the commercial sizes can be reached with a fair proportion of the crop. Thinning is thus seen to be more necessary during those years when a large crop is in prospect, so that the general level of the pack can be raised accordingly.

PROFITABLE PEACH PRODUCTION FACTORS

(Continued from page 10)

We think that the poorer growth made by the trees in lespedeza and sweet clover is due to the fact that they suffered more in periods of moisture deficiency than trees in cultivation alone or with summer cover crops. From moisture samples taken, we observed that the amount of moisture in the soils under the sweet clover and lespedeza was reduced to a critical point, that is, to the wilting percentage of moisture for that soil, for a considerable period of time in each of those years. In 1936 we had little summer rainfall; the moisture in the first two feet of soil in the lespedeza plot was reduced both by the trees and the cover crop to the wilting percentage for a four weeks' period in late June and July, and again in August for a three weeks' period from August 1 to August 21. This last period was the time of final fruit swelling.

The growing cover crops require plant nutrients for their growth and in this way compete with the tree. In 1936, we studied the nitrate content of the soil of plots at weekly intervals. Nitrates were low under lespedeza and cultivation, but high under sweet clover and soybeans. The growth of the trees, therefore, appears to have been affected more by periods of critical moisture shortage rather than by nitrate deficiency.

We have been attempting to determine the best way to handle the sweet clover-lespedeza to reduce to a minimum this competition with the trees for moisture. It may mean that alternating middles of lespedeza or sweet clover with a summer cover such as soybeans, cowpeas, or crotalaria will be satisfactory. Whatever the cover used, it should be clipped or disked up during long dry spells to conserve the moisture for the trees.

There are certain definite advantages in the use of cover crops in a peach orchard. Where soils are not of sufficient depth to permit the use of summer cover crops, certainly a winter cover crop should be used, not only from the standpoint of its benefit in preventing washing, but also from the standpoint of its nutritional value to the trees when disked under each spring. The cover crop serves a very important function in utilizing mineral elements, particularly nitrates, and preventing their leaching from the soil in winter. These are made available to the tree along with other important mineral constituents when the cover crop decays in the soil.

While the practice of growing summer and winter cover crops may be used to advantage during the early life of the orchard, the single winter cover crop may be the only one that can be used after the trees have reached bearing age. Since in many orchards the trees are planted 20 by 20 feet apart, the root systems come to occupy all of the area between the trees when the trees are about five to six years of age. Cover crops, especially deep-rooted ones like sweet clover, may compete with the trees when this stage of growth is reached.

Many growers report that they are unable to obtain even a winter cover crop in their old peach orchards after the trees have begun to crowd. A satisfactory cover will not be obtained unless fertilizer is used at the time the cover crop is seeded. I have seen the production of very satisfactory cover crops in old orchards by this method.

Another very important use of the cover crop in addition to its nutritional value is to facilitate water penetration and prevent run-off. In our experimental orchard which is planted on a rather steep slope, very little washing has been observed from spring rains following disking in of a good rye and vetch winter cover crop. Likewise, on this same soil, little washing has been observed from late summer rains after good summer cover crops have been disked under. By a good cover crop, of course, is meant a good growth of plants over the entire area.

Other important factors in the profitable production of peaches are the size and quality of fruit. It is in years of heavy production especially that these factors are important in bringing an increased price to the producer. Our most important commercial variety of peach which we are growing today is not one of the highest quality even when grown under favorable conditions. On overloaded trees with poor leaf area, where sufficient thinning has not been done, the fruits may be small and of inferior quality. This kind of fruit does not sell readily and in years of heavy production fruits of poor size and quality do not appeal to the consumer, and their accumulation on the market tends to aggravate the price depression created by a large crop. In Virginia the Elberta variety has proved very satisfactory as a commercial variety. It fits well into the seasonal distribution of peaches from other producing centers. Here, as in other states, however, this variety is not of the highest quality when produced on trees with a poor leaf area and on soil inadequately supplied with moisture.

In experimental studies made with the Elberta variety, we have found that fruits grown with a small leaf area—about 10 to 15 leaves per fruit—are small, of rather poor quality,

low in sugar and somewhat bitter. With a more adequate leaf area—30 to 40 leaves per fruit—the size and eating quality are far superior; hence the necessity for hand thinning to adjust the fruit-leaf ratio in years when the set is heavy.

Pruning to regulate the size of the load as well as to increase the vigor of bearing trees is also an important adjunct to thinning in securing size and quality. The value of nitrogen for maintaining tree vigor has already been mentioned. Pruning of bearing trees is also important and necessary in stimulating a vigorous shoot growth. Vigorous shoots produced near the ends of cut-back branches usually bear large leaves, and when these shoots are thinned sufficiently so that the leaf surface is well enough exposed to sunlight to permit maximum leaf function, the fruits produced are usually of good size and color.

An adequate supply of moisture available to the tree is of equal importance to leaf area in obtaining color and size of fruit. The peach fruit exhibits three definite growth periods as it increases in size from blossoming to maturity. For the Elberta variety, the first period covers about 60 days while the young fruit increases principally in axial and suture diameters. Then follows a rather slow period of development which is roughly the period of pit hardening and which lasts about 40 days. Finally a third period of growth is noted which starts about 30 days before final harvest.

This last period which the grower knows as the period of final swell is one of marked increase in volume, and the fruit fills out in cheek diameter. When soil moisture is lacking during this final period, even though the fruits on the tree have been well thinned, the unfavorable effect on final fruit size will be marked. It was this condition that existed in many parts of Virginia this year and accounted for the large quantity of fruit of small size and color. The effect of cover crops on the moisture supply during this period of final swell is one to be considered, especially on shallow soils.

In addition to growth factors which may affect size and quality, the importance of developing higher quality varieties of peach must be emphasized. As a result of the breeding work that has been in progress for the past 25 years, we are just beginning to see results in the production of new varieties of higher quality. Some of these have been fairly widely tested while others are on preliminary trial. Many show distinct promise for growers who are interested in planting varieties that mature earlier than Elberta. Peach growers of any region should be interested in these new varieties which may compete on the market with the varieties they are now growing. It is a safe prediction that commercial peach varieties of the future must be of higher quality if this fruit is to hold its place on the market in competition with other fruits.

POLLINATION

(Continued from page 16)

len was carried 200 miles to the largest planting of Eumelan vines in New York State and there mixed with Lycopodium powder, also a pollen product. Several hundred vines of Eumelan were then dusted with the mixture, and a like number untreated were left for a comparison. The time consumed in the operation was not over an hour.

Largely because this variety had borne very light crops the past few years, and as a result plant food reserves had been stored in excess of the quantity normally needed, the clusters were more compact the past season than usual. It has already been noted that well-nourished vines, even though they be self-sterile or imperfectly-fertile varieties, form better clusters when there is a sufficiency of plant food.

In spite of the fact that the clusters were above normal in compactness, these vines that were cross-pollinated with the Aramon X Rupestris Ganzin pollen, using the hand duster for dispersal of the pollen, yielded 50 per cent more fruit than the untreated. The increase was due to the fact that more berries on the cluster were fertilized on the dusted than on the untreated vines which were dependent on chance cross-pollination and fertilization.

In view of these facts, it seems entirely practical from a commercial standpoint to cross-pollinate artificially certain varieties of grapes that are greatly in demand for specific purposes, thereby improving the appearance of the clusters for dessert purposes and at the same time greatly increasing the yields.

APRICOT CULTURE

(Continued from page 27)

ern market are usually packed in standard four-basket crates, weighing packed approximately 26 pounds; 1,000 crates generally constitute a carload. Of more recent years an increasing tonnage has been shipped either packed or loose in small lugs of about the same capacity as the crate.

Apricots are sold to the cannery at a given price per ton, the price being determined to a certain extent by size which is specified as so many fruits per pound.

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NUT VARIETIES

THE results of a survey conducted by D. C. Snyder of Iowa, chairman of the survey committee of the Northern Nut Growers' Association and presented at the meeting of the Northern Nut Growers' Association at Geneva, N. Y., in September, 1936, revealed considerable information concerning many of the nut varieties discovered in the earlier prize nut contests of the association. These reports come from a wide range of conditions and with the older sorts cover several years' observations. The prospective planter of nuts will find this report very instructive.

Thomas, one of the oldest of the black walnut varieties, was mentioned favorably by nearly all of the 64 growers who reported. Its most serious defect is susceptibility to the canker disease. The Ohio black walnut was generally unsatisfactory, being rather unproductive, lacking in quality and with too thick a husk. Stabler also received many unfavorable reports, being lacking in hardiness, vigor and quality.

Stambaugh was reported favorably by many and was considered by Mr. Snyder as being a valuable variety for some sections, the best reports coming from Illinois and Oklahoma. Ten Eyck, another of the older varieties, also received favorable mention from several growers. Many other black walnut varieties were listed in Mr. Snyder's paper, but information concerning them was too meager to warrant any conclusions as to the merits of the varieties.

The Winkler native hazel was generally satisfactory within a radius of 200 miles of its place of origin in southeastern Iowa. Rush, another native hazel, received many favorable reports, although there were some reports of its lacking hardiness. For a native hazel it is about as good as any of its class now available.

Many hickories were mentioned, but the information concerning any one variety was very meager. The Taylor, Kirtland and Kentucky hickories were considered to be three of the best by Dr. W. C. Deming whose knowledge of hickory varieties is very extensive. Stratford was considered promising because of its early bearing habit and adaptability to bitternut stocks. Rockville also received favorable mention by several. Fairbanks was hardy, vigorous and productive, but only medium in quality. Swaim was also considered good.

Certainly one who reads this report receives the impression that the need is great for more extensive variety tests. The need is equally great for better varieties.—G. L. SLATE, Sec'y, Northern Nut Growers' Assn., Geneva, N. Y.

EDITORIAL

(Continued from page 7)

the hazards are somewhat reduced over former times. A block of prunes, sweet cherries where they will thrive, the more disease-resistant raspberries, and the superior new strawberries should attract many customers to the roadside market and embellish the load which goes to the city market. All this means a better American horticulture and a more profitable industry.

Again, there is the desirability in some instances of diversifying with poultry, dairying, or some other line than fruit. Poultry fits into the picture quite well, provided the market is not already oversupplied. It requires an entirely different equipment and knowledge but in nearly every section one finds these two lines successfully carried. But as a rule the general farmer has not been a very successful orchardist and for the large scale farmer to have a few acres of orchard is quite the reverse of the thought here expressed. The farm orchardist has rapidly passed out and the intensive fruit specialist has taken his place. But with this new situation a certain amount of diversification has its place.

NEW

- High Speed Pumps
- Air Conditioned Carton
- Carboy Cart and Tilter

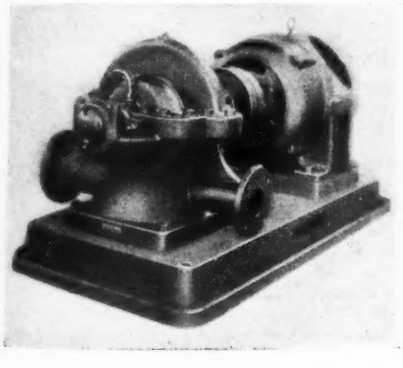
By HANDY ANDY

Comes April and the busy season, but the really busy fruit grower is never too busy to stop and pick up a new idea. This is the place to exchange some of these ideas and to let each other know about new products and ideas for our mutual benefit. You probably have some ideas that are new and helpful so just drop me a line about them. The address is Handy Andy, American Fruit Grower, 1370 Ontario St., Cleveland, Ohio.

HIGH SPEED PUMPS ●

Orchard irrigation calls for plenty of water. Frank H. Wissler, Virginia fruit grower, says that he has used as high as 2,000 gallons of water per tree every two weeks during the growing season. To supply the large amounts of water for irrigation it is necessary to have a pump that will give the proper delivery. I know of one fruit grower who obtains his water from a river that is more than 75 feet below the level of his orchard.

New, high-speed centrifugal pumps are now on the market that will deliver from 10 to 6,000 gallons per minute at a head of 10 to 280 feet depending on the size of the unit. The new pump unit usually includes a coupled electric motor of enough power to suit the size of the pump. Equipment like this provides water for every part of the orchard whether large amounts of water are needed for irrigation or for filling storage tanks for spraying water. The centrifugal pump is particularly adapted to pumping water from rivers and reservoirs. Other types are available for wells.



It seems water is becoming more and more important on the fruit farm. The latest use for water in large quantities is for washing the fruit to get rid of residues. The U.S.D.A. recommends that each bushel of fruit put through the acid bath of the washer be rinsed with three or four gallons of clean water. That means a lot of water even for the medium-sized orchard.

AIR CONDITIONED CARTON ●

Here's a new air conditioned fruit shipping box that cradles each fruit in a separate compartment. The box

itself is made of sturdy corrugated fibre board and is constructed with air vents so that the air can circulate through the box. This type of ventilation allows for rapid escape of field heat resulting in less damage from breakdown and other high-temperature troubles. As you can see from the illustration, the box makes for good display on the grocer's shelves.

Padlocks, as an Irish friend puts it, are always getting themselves lost. One of the simplest ways I've seen to keep track of padlocks about the fruit farm is to "lock" them in the packing shed. This is done by hanging a six-inch length of chain over a nail on the wall; then lock the padlocks in the chain links.

CARBOY CART AND TILTER ●

Dumping acid out of a full carboy for use in the fruit washer is a pretty ticklish business unless you have the right equipment. Commercial hydrochloric acid used in the washers will burn if it gets on the skin, and it eats away clothes if spilled on them. New type carboy carts and tilters are now available that take the danger out of handling carboys. The cart allows for moving carboys about the packing shed easily, and with the tilter you can pour acid out of the carboy with ease whether the container is full or almost empty. Since the wood casing on all carboys is the same size, all carboys will fit in the cart rack and tilter.

SUCCESSFUL ORCHARDS

• A "ROUND TABLE" PAGE FOR EVERY GROWER •

This page is a place for growers to get together and exchange experiences and ideas. The beginner, as well as the veteran, will find here many practical suggestions for better and more profitable fruit growing. In return for the helps you receive from this page, be ready to pass on, for the benefit of others, any new idea, method or procedure you have developed or run across. Just jot it down as it occurs to you (a postcard will often do) and mail it to the "ROUND TABLE EDITOR," AMERICAN FRUIT GROWER. Don't worry about fancy writing. What the readers of this page want are practical pointers—that are to the point.

BEES BECOME APARTMENT DWELLERS

FRUIT GROWERS will soon be giving thought to bees. Some may be wondering if their colonies are strong enough for proper pollination. Ralph R. Van Dine of New York, tells of his experience with some bees that were *too* strong.

"Perhaps some of your readers of the 'Round Table' page who keep bees might be interested to know what a swarm of bees can do to make trouble.

"I have a relatively small orchard of 70 trees and for pollination purposes I have five strong colonies of Italian bees.

"Because I happen to know a little about bees, the president of our bee society and several beekeepers asked me to accompany them to the north side of Long Island to rid a garage-apartment of eight strong—extra strong—colonies of bees.

"It so happened that five years ago someone lost a swarm of bees. The queen of the swarm located a garage with chauffeur's apartments above it. Above each window was a small gable which made a nice place for the hive. The bees got into eight of these gables and all through the walls and the chauffeur and his family had to move out.

"It took more than a month to get the bees out of the walls with smoke. All of the gables had to be removed and holes had to be made in the plaster through which to inject the smoke. Several pounds of honey were removed from the inside of the gables, walls, and living rooms. But this was certainly a costly way to get honey!

"Each swarm was made up of thousands of bees. The swarms weighed from seven to nine pounds each. The house was a mess and it is pretty certain that somebody got stung.

"So, if any 'Round Table' readers who have bees, fail to have the queen's wings clipped, they had better watch out when swarming time comes or the bees might go up in the storage loft, the house attic or walls, or in any of the buildings. After the bees are located in any of these places for awhile, with queens laying 1000 to 3000 or more eggs a day, somebody's going to have plenty of bees."

And your "Round Table" editor might add: That same somebody is going to have lots of trouble. Clipping of queen's wings is not so difficult if the person doing it knows his business, and it helps to keep your bees in the orchard. How about some more ideas on bees? Send them in for the "Round Table" page.

GRAFTING SUCCESSFUL FOR MICHIGAN GROWER

MICHIGAN fruit grower, Glen H. Pilkinton has enjoyed exceptional success with bridge grafting and sends in the following:

"I have found many ideas in your magazine and am sending you an item which might be helpful to other growers. Here is a suggestion for bridge grafting.

"We cut the suckers or scions from trees and store them in a cold place until time for use, after freezing weather. The trunk of the girdled tree is covered with soil or a wax. When the time comes for grafting, the soil is removed from around the trunk. The ends of the scion are cut in a similar manner as when cleft grafting. One of the cut ends of the scion is placed on the bark at the edge of the girdle and a "V" is cut with the knife back-slanted slightly towards the center of the "V". This cuts the scion and the bark at the same time. Remove wood from the thin side of the scion, wedge if necessary to make the scion the same thickness as the bark. Then force the scion into the "V" with the thick part out. Measure the scion, allowing enough length to span girdle, and repeat process at upper end. A scion with bow in it, preferably one that grew on the side of the limb, is best. Place tacks so the heads will cover the ends of the scions in the "V" of the bark.

"The grafts are spaced two to three inches apart around the trunk. I use brush or black wax. The grafts are then covered with a burlap sack held in place by a tack at the lap and the sack is covered with soil. I have grafted 40 or 50 trees in my orchard by this method and have not lost a tree. I am sending sample of graft to show more clearly how the unions are made."

Accompanying this item is an illustration showing the sample of bridge grafting sent in by Mr. Pilkinton.

COLORED GUARDS AID IN KEEPING RECORD

FROM James P. Kegel, Jr., Wisconsin fruit grower, comes a new idea in keeping a record of orchard trees. A record of the trees is important for every fruit farm and "Round Table" readers will be interested in what Mr. Kegel has to say.

"I use the following method to keep an accurate record of the variety and age of replacement trees: Each year after cutting out the wire rabbit guards from the roll, I stack the squares over a large pan, placing heavy weights on each corner of the pile. Then I pour over the pile a quantity of colored implement paint thinned a bit to make it flow easier. A different color each year or for each variety helps me identify the stock after the guards have been placed."

Your "Round Table" editor will be glad to have more ideas on orchard record keeping from readers.

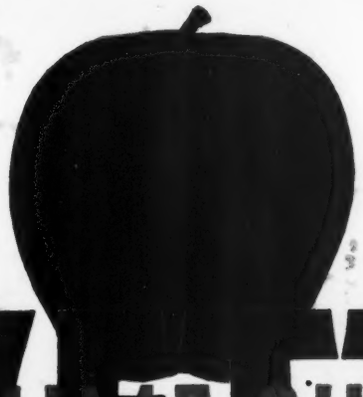
UNIQUE EXPERIENCE IN TOP-WORKING TREES

PENNSYLVANIA fruit grower, J. Russell Edgerton, writes regarding his experience with top-working fruit trees:

"In looking over some old copies of AMERICAN FRUIT GROWER I noted a comment on the 'Successful Orchards' page to the effect that completely top-working a tree in one operation was apt to be fatal. I know that is the most common understanding, but some observations have led me to wonder whether there may not be a variable in the picture in the form of soil condition or a similar factor.

"Some years ago I ruthlessly dehorned a 15-year-old open center tree at about two feet from the center crotches, set two or more scions in each stub, and let nature do her best. She did so remarkably well that every scion grew and that tree a dozen years later can scarcely be told from its neighbors except that it is better shaped.

"Two years ago we worked over some less vigorous and older trees on the same soil and chose to be more conservative in how much we did at one time. The result was growth so weak that it is debatable whether to continue the project or not. There were a few places cut back much more than others, to a degree similar to the earlier job, and these scions all grew vigorously. A further setting on more wood last spring gave the same result, so now I am planning to cut back to strong-growing scions and see whether they 'spruce up' or 'pass out.'"



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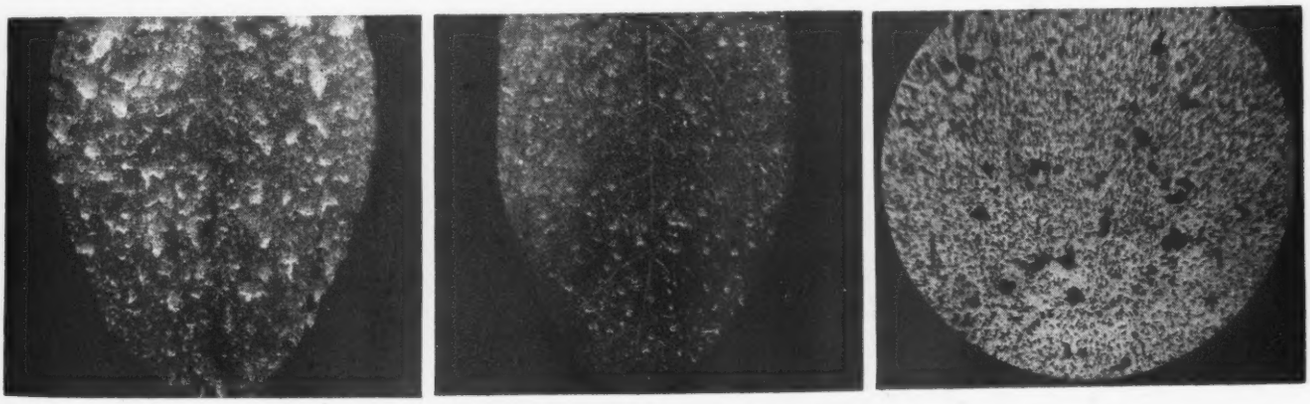
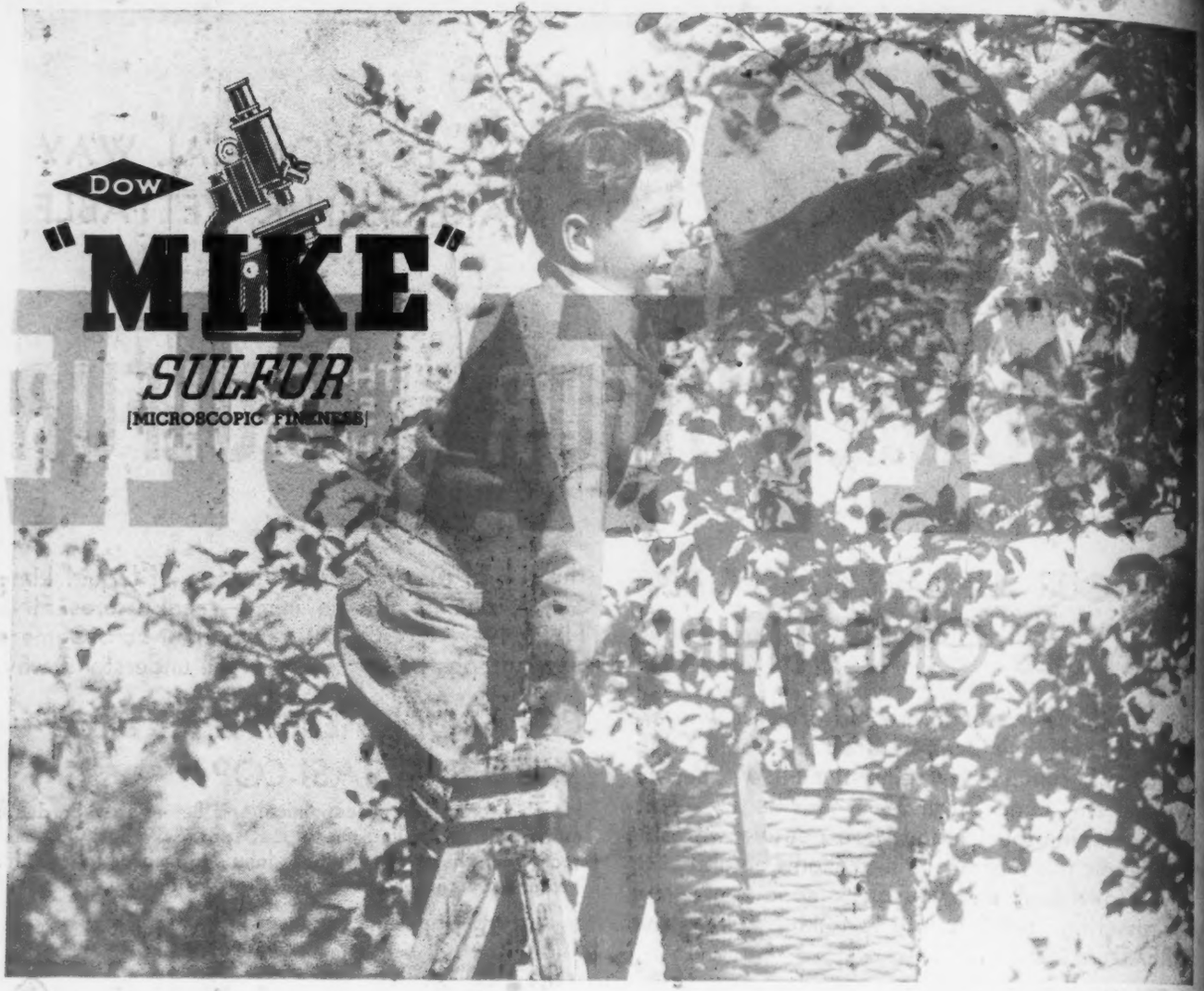


THE MICRO-CAMERA TELLS THE STORY

Left—Cortland apple leaf sprayed with 2 lbs. of Dry Lime Sulfur and 8 lbs. of 325 mesh sulfur to 100 gals. of water. Note heavy, uniform deposit of colloidal, flocculated sulfur.

Center—Same leaf after ½ inch rain. Note good coating of sulfur still remaining. Right—Micro-photograph of surface sprayed with 2 lbs. of Dry Lime Sulfur and 8 lbs. of 325 mesh sulfur to 100 gals. of water. The Dry Lime Sulfur in this combination has flocculated the sulfur and has also acted as a "tooth," holding the sulfur particles tenaciously to the surface.

SHERWIN-WILLIAMS
SPRAY AND DUST MATERIALS



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